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**NATIONAL BUREAU OF STANDARDS**

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**CIRCULAR OF THE NATIONAL BUREAU OF STANDARDS C406**

**(Supersedes Circular C399)**

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**STANDARD TIME  
THROUGHOUT THE WORLD**

REAU OF STANDARDS \_\_\_\_\_

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# STANDARD TIME THROUGHOUT THE WORLD<sup>1</sup>

## ABSTRACT

This Circular is a revision and enlargement of Circulars 280 and 399, which it supersedes and which bore the same title. It gives a brief historical sketch of the development of the standard time system, time-zone maps of the United States and of the world, a list of stations transmitting radio time signals, a list of the times used in several large cities, a list of the legal times used in most of the countries of the world, and other information regarding standard time.

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## I. INTRODUCTION

The development, within the last few years, of means of international communication such as international news service, world-wide telephony, transoceanic aviation, exploration, and radio broadcasting, has brought about an increased consciousness of the difference in time between different geographic centers. The demand for information regarding time used in different parts of the world led to the publication in 1925 of Bureau of Standards Circular 280, "Standard Time Throughout the World". This was revised in 1932 as Circular 399 with the same title. Since then, changes have been made in the times of several localities. The present Circular includes these changes, gives additional information regarding the use of legal time, and supersedes the two former Circulars.

Every effort has been made to give the latest information, and the data are believed to have been the best available at the time this Circular was prepared.

<sup>1</sup> Prepared by Ralph E. Gould, Chief, Time Section.

## II. HISTORICAL SKETCH

From the earliest civilization man has reckoned time by the apparent motion of the heavenly bodies. The rotation of the earth on its axis from west to east causes these bodies to "rise" in the east and "set" in the west. Consequently points to the east of us have sunrise before we do, or, as we say, their time is faster than ours; while points to the west have time that is slower than ours. This rotation of the earth about its axis once in 24 hours gives a time change of 1 hour for every  $15^\circ$  of longitude. That is, if observations were made on the transit of the sun across the meridian at points separated by  $15^\circ$  of longitude, it would be found that the time of transit at two such points would differ by 1 hour. If the separation of the points of observation were decreased, the difference in time would be decreased in the same proportion. These times would all be true local times, using the transit of the sun across the meridian as a standard.

Since the distance around the earth is less at points not on the Equator than at the Equator the distance on the earth's surface corresponding to a time difference is also less in the same proportion. For example, at the Equator  $15^\circ$  corresponds to about 1,040 miles, while at the latitude of New York  $15^\circ$  corresponds to only about 784 miles. Or, at the Equator, a difference of about 17 miles makes a time difference of 1 minute, while in the latitude of New York a difference of only 13 miles makes a difference of 1 minute in true local time.

The need of a uniform time began to be felt in the United States about 1870, and the railroads gradually adopted a system for use on their roads specifying definite important centers or junction points at which changes of 1 hour should be made. As means of communication still further developed, it became apparent that some system of international time must be established.

In 1884 an international congress was called in Washington to consider the subject of a world standard of time. The world was divided into zones, each covering  $15^\circ$  of longitude, the time for each zone being that of the meridian passing through its approximate center and the time in adjacent zones differing by 1 hour. The meridian passing through the observatory at Greenwich, England, was chosen as the zero meridian from which all time should be reckoned. Although there was no definite agreement as to the adoption of this time by the different nations, the plan was gradually accepted.

The adoption of time differing from Greenwich by an odd number of half hours soon made its appearance. This slight departure from the original plan is of advantage in some places, since it more nearly agrees with true local time. In New Zealand the time is  $11\frac{1}{2}$  hours faster than Greenwich time, in Burma  $6\frac{1}{2}$  hours faster, while in India, excepting Calcutta, it is  $5\frac{1}{2}$  hours faster.

Table 1 shows the spread of the use of the International Time Zone System. In some countries, as in the United States, standard time came into use without any legislative action. The dates given are either those of official adoption or of the earliest recorded use of standard time.

TABLE 1.—Showing increasing adoption of International Time Zone System

| Year | Month and day    | Country                                                 | Year | Month and day    | Country                                                                                                                                       |
|------|------------------|---------------------------------------------------------|------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 1868 | November.....    | New Zealand.                                            | 1911 | June 8.....      | Guadeloupe.                                                                                                                                   |
| 1879 | September 1..... | Sweden.                                                 |      | July 1.....      | French Somali Coast, Madagascar.                                                                                                              |
| 1880 | .....            | Great Britain.                                          |      | July 18.....     | French India.                                                                                                                                 |
| 1883 | .....            | United States.                                          |      | September.....   | British Guiana.                                                                                                                               |
| 1888 | January 1.....   | Japan.                                                  |      | January 1.....   | Dahomey, French Cameroun, French Congo, French Guinea, Mauretania, Niger Territory, Senegal.                                                  |
| 1891 | October 1.....   | Austria, Bulgaria, Hungary, Macedonia, Rumania, Servia. | 1912 | January 1.....   | Portugal, Azores, Cape Verde, Macao, Madeira, Portuguese East Africa, Portuguese Guinea, Portuguese West Africa, Principe, St. Thomé, Uhyden. |
| 1892 | .....            | Cape Colony, Orange River, Transvaal.                   |      | January 13....   | New Caledonia, New Hebrides.                                                                                                                  |
|      | May 1.....       | Belgium, Netherlands. <sup>1</sup>                      |      | February 1.....  | Jamaica.                                                                                                                                      |
| 1893 | May 1.....       | Germany.                                                |      | March.....       | Anquilla, Antigua, Barbada, Dominica, Monserrat, Nevis, St. Kitts, Tortola, Trinidad.                                                         |
|      | November 1.....  | Italy.                                                  |      | March 2.....     | Bahamas.                                                                                                                                      |
| 1894 | January 1.....   | Denmark.                                                |      | April 1.....     | British Honduras.                                                                                                                             |
|      | June 1.....      | Switzerland.                                            |      | May 1.....       | Indo-China.                                                                                                                                   |
| 1895 | February 1.....  | Australia.                                              |      | October 1.....   | French Oceania.                                                                                                                               |
|      | May 1.....       | Norway.                                                 |      | January 1.....   | Brazil.                                                                                                                                       |
| 1896 | September.....   | Natal.                                                  |      | July 28.....     | Greece.                                                                                                                                       |
|      | .....            | China Coast, Hong Kong, Philippines.                    |      | October 1.....   | Ireland.                                                                                                                                      |
| 1899 | January 1.....   | Formosa, Miyako, Pescadores, Yarayama.                  |      | September 1..... | Chile.                                                                                                                                        |
|      | May 1.....       | South Australia (changed to 9½ hours fast.)             |      | September 1..... | Nigeria.                                                                                                                                      |
| 1900 | .....            | Turkey.                                                 |      | September 16.    | Poland.                                                                                                                                       |
|      | October 1.....   | Egypt.                                                  |      | April 1.....     | Siam.                                                                                                                                         |
| 1901 | January 1.....   | Spain.                                                  |      | May 1.....       | Argentina, Uruguay.                                                                                                                           |
| 1903 | .....            | Union of South Africa (changed to 2 hours fast).        | 1914 | January 15.....  | Costa Rica, Nauru.                                                                                                                            |
| 1904 | .....            | Western Russia.                                         | 1916 | .....            | U. S. S. R.                                                                                                                                   |
| 1905 | July 1.....      | India and Burma.                                        | 1918 | .....            | Mexico.                                                                                                                                       |
| 1906 | .....            | Seychelles.                                             | 1919 | .....            | Netherlands India.                                                                                                                            |
| 1907 | January 1.....   | Mauritius, Chagos Archipelago.                          | 1920 | April 1.....     | Gambia.                                                                                                                                       |
| 1908 | July 28.....     | Peru.                                                   | 1921 | .....            | .....                                                                                                                                         |
|      | January 1.....   | French Guiana. Ivory Coast.                             |      | .....            | .....                                                                                                                                         |
| 1911 | March 9.....     | France, Algeria.                                        |      | .....            | .....                                                                                                                                         |
|      | April 12.....    | Tunisia.                                                |      | .....            | .....                                                                                                                                         |
|      | May 1.....       | Martinique.                                             |      | .....            | .....                                                                                                                                         |
|      | May 15.....      | Miquelon.                                               |      | .....            | .....                                                                                                                                         |

<sup>1</sup> Netherlands changed to Amsterdam time in 1903.

### III. STANDARD TIME IN THE UNITED STATES

#### 1. TIME ZONES

Although the United States has used standard time since 1883, no legislative action for the country as a whole is recorded until March 19, 1918, when Congress directed the Interstate Commerce Commission to establish limits for the various time zones in this country. Changes in these boundaries have been made from time to time, in order that the time changes may occur at such points as to result in a minimum of inconvenience.

The United States is divided into four standard time zones, each approximately 15° of longitude in width. All places in each zone use, instead of their own local time, the time counted from the transit of the "mean sun" <sup>2</sup> across the meridian which passes through the approximate center of that zone.

These time zones are designated as Eastern, Central, Mountain, and Pacific, and the time in these zones is reckoned from the 75th, 90th, 105th, and 120th meridians west of Greenwich, respectively.

<sup>2</sup> The interval between successive passages of the sun across the meridian is somewhat variable, and for this reason apparent solar days are unequal. Therefore, mean time has been adopted, which is kept by a fictitious or "mean sun" moving uniformly in the Equator at the same average speed as that of the real sun, thus making days of equal length. It is "mean noon" when this "mean sun" crosses the meridian.

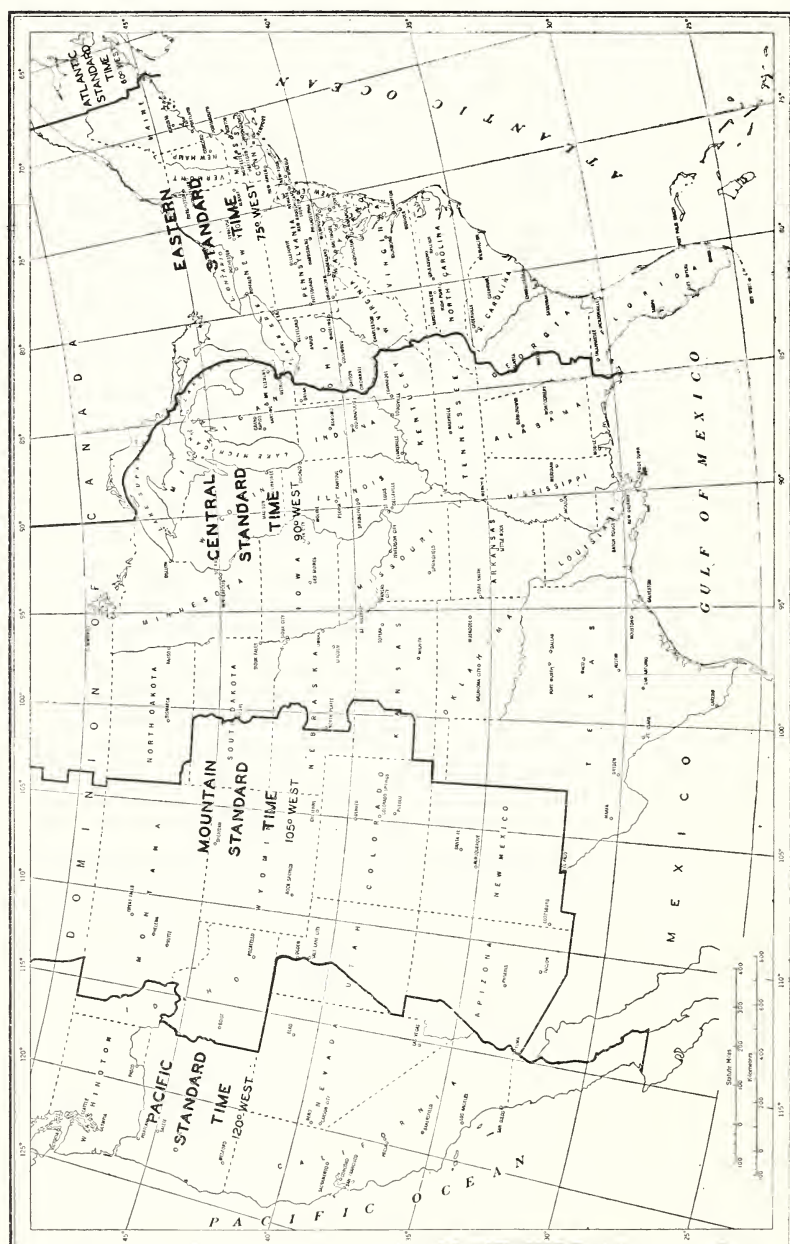


FIGURE 1.—Standard time zones of the United States, with adjacent parts of Canada and Mexico

The time in the various zones is slower than Greenwich time by 5, 6, 7, and 8 hours, respectively.

The question of changing from the time of one time zone to that of an adjacent zone arises in practice largely in the operation of railroads. Because of the inconvenience of changing the time by the necessary amount of 1 hour at every point where a railroad crosses one of these boundary lines, the more convenient practice has usually been followed of making the change at some terminal or division point on the road, at some junction point, or at the boundary line between the United States and Canada. The result is that practically the boundaries of the time zones are defined by the lines connecting these points of railroad time change. Because of the location of these railroad junctions or terminals the resulting lines are somewhat irregular.

Figure 1 shows the time zones and present boundary lines as defined by the Interstate Commerce Commission.

## 2. CITIES ON TIME-ZONE BOUNDARIES

There are listed below some of the more important cities on the boundaries of the time zones.

(a) The following municipalities located on the boundary between the Eastern and the Central Time Zones use eastern standard time:

|                                                                       |                                                                         |                    |
|-----------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------|
| Detroit, Mich.                                                        | Asheville, N. C.                                                        | Perry, Ga.         |
| Toledo, Ohio, and all other cities in Ohio situated on this boundary. | Franklin, N. C.                                                         | Thomasville, Ga.   |
| Williamson, W. Va.                                                    | McDonough, Ga.                                                          | Apalachicola, Fla. |
| Dungannon, Va.                                                        | Macon, Ga., and points on Southern Railway between McDonough and Macon. |                    |
| Bristol, Va.                                                          |                                                                         |                    |

All other places on this boundary use central standard time.

(b) The following municipalities located on the boundary between the Central and the Mountain Time Zones use central standard time:

|                     |                   |                |
|---------------------|-------------------|----------------|
| Murdo, S. Dak.      | Stockton, Kans.   | Ellis, Kans.   |
| Mackenzie, S. Dak.  | Plainville, Kans. | Liberal, Kans. |
| Phillipsburg, Kans. |                   |                |

All other places on this boundary use mountain standard time.

(c) All municipalities on the boundary between the Mountain and the Pacific Time Zones use mountain standard time except Huntington, Oreg., which uses Pacific standard time.

## 3. TERRITORIES AND INSULAR POSSESSIONS

Standard time is also used in the territories outside of the continental United States. The places and the time used are given below:

|                      |                                  |
|----------------------|----------------------------------|
| Alaska (see table 4) | 10 hours slower than Greenwich.  |
| Guam                 | 9½ hours faster than Greenwich.  |
| Hawaii               | 10½ hours slower than Greenwich. |
| Panama Canal Zone    | 5 hours slower than Greenwich.   |
| Philippines          | 8 hours faster than Greenwich.   |
| Puerto Rico          | 4 hours slower than Greenwich.   |
| Samoa                | 11 hours slower than Greenwich.  |
| Virgin Islands       | 4 hours slower than Greenwich.   |

#### 4. TIME IN SEVERAL LARGE CITIES OF THE UNITED STATES AT 12 NOON, EASTERN STANDARD TIME

|                         |             |                           |             |
|-------------------------|-------------|---------------------------|-------------|
| Atlanta, Ga.....        | 11:00 a. m. | Milwaukee, Wis.....       | 11:00 a. m. |
| Baltimore, Md.....      | 12:00 noon. | Minneapolis, Minn.....    | 11:00 a. m. |
| Birmingham, Ala.....    | 11:00 a. m. | Newark, N. J.....         | 12:00 noon. |
| Boston, Mass.....       | 12:00 noon. | New Haven, Conn.....      | 12:00 noon. |
| Charleston, S. C.....   | 12:00 noon. | New Orleans, La.....      | 11:00 a. m. |
| Chicago, Ill.....       | 11:00 a. m. | New York, N. Y.....       | 12:00 noon. |
| Cincinnati, Ohio.....   | 12:00 noon. | Norfolk, Va.....          | 12:00 noon. |
| Cleveland, Ohio.....    | 12:00 noon. | Omaha, Nebr.....          | 11:00 a. m. |
| Columbus, Ohio.....     | 12:00 noon. | Philadelphia, Pa.....     | 12:00 noon. |
| Dallas, Tex.....        | 11:00 a. m. | Pittsburgh, Pa.....       | 12:00 noon. |
| Denver, Colo.....       | 10:00 a. m. | Portland, Oreg.....       | 9:00 a. m.  |
| Des Moines, Iowa.....   | 11:00 a. m. | Providence, R. I.....     | 12:00 noon. |
| Detroit, Mich.....      | 12:00 noon. | Richmond, Va.....         | 12:00 noon. |
| Hartford, Conn.....     | 12:00 noon. | Rochester, N. Y.....      | 12:00 noon. |
| Houston, Tex.....       | 11:00 a. m. | Salt Lake City, Utah..... | 10:00 a. m. |
| Indianapolis, Ind.....  | 11:00 a. m. | San Francisco, Calif..... | 9:00 a. m.  |
| Kansas City, Mo.....    | 11:00 a. m. | Seattle, Wash.....        | 9:00 a. m.  |
| Los Angeles, Calif..... | 9:00 a. m.  | St. Louis, Mo.....        | 11:00 a. m. |
| Louisville, Ky.....     | 11:00 a. m. | St. Paul, Minn.....       | 11:00 a. m. |
| Memphis, Tenn.....      | 11:00 a. m. | Washington, D. C.....     | 12:00 noon. |

#### 5. TIME SIGNALS IN UNITED STATES

The standard time for the United States is derived from star observations made at the United States Naval Observatory, Washington, D. C. After the necessary corrections have been applied, signals from a transmitting device are sent by wire to the radio stations at Arlington, Va., (NAA), and Annapolis, Md., (NSS), where they are automatically broadcast by radio.

All naval time signals are made in a standard manner, which is as follows:

The signals begin 5 minutes before the hour and consist of a dash on each second, except on the seconds listed below:

55 minutes; 29, 51, and 56 to 59 seconds.  
 56 minutes; 29, 52, and 56 to 59 seconds.  
 57 minutes; 29, 53, and 56 to 59 seconds.  
 58 minutes; 29, 54, and 56 to 59 seconds.  
 59 minutes; 29, and 51 to 59 seconds.

Beginning exactly on the hour a much longer dash is sent. In all cases the exact second is denoted by the beginning of the dash, the end being without significance. It will be noted that the number of seconds sounded immediately following the single second omission and preceding the long omission at the end of each minute indicates the number of minutes of the signal yet to be sent. For instance, the signal for 56 minutes and 52 seconds is omitted and then 3 seconds are sounded, indicating that 3 minutes of the signal remain to be transmitted.

These time signals, if received directly and automatically are seldom in error by as much as 0.10 second. The average error is generally less than 0.02 second.

The signals from San Francisco, Calif., (NPG), are broadcast from a clock, located at Mare Island, which is first synchronized with the signals from Arlington.

Darien, Canal Zone (NBA), and Honolulu, T. H. (NPM), relay the signals received from Arlington.

Cavite, P. I. (NPO), transmits signals from a clock at the Manila Central Observatory. These signals are independent of Arlington, and the errors may be somewhat greater than for the other stations.

All of these signals are sufficiently close for ordinary commercial use.

Table 2 gives a list of the official naval stations which broadcast the time signals and the time of broadcast.

TABLE 2.—Radio transmission of official time signals <sup>1</sup>

[The times given in this table are those of the final signal of the series]

| Station                              | Call letters | Fre-<br>quency           | Time of transmission                                                                                  |                                                                 |
|--------------------------------------|--------------|--------------------------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
|                                      |              |                          | Greenwich civil time <sup>2</sup>                                                                     | Standard time of the station                                    |
| Arlington, Va.                       | NAA          | <i>Kilocycles</i><br>113 | Each hour except 9 and 11 a. m. and 9 and 11 p. m., eastern standard time.                            |                                                                 |
|                                      |              | 690                      | 3 <sup>h</sup> , 17 <sup>h</sup>                                                                      | 12 noon, 10 p. m.                                               |
|                                      |              | 4, 525                   | 5 <sup>h</sup>                                                                                        | 12 midnight.                                                    |
|                                      |              | 8, 410                   | 17 <sup>h</sup>                                                                                       | 12 noon.                                                        |
|                                      |              | 9, 050                   | 0 <sup>h</sup> , 3 <sup>h</sup> , 8 <sup>h</sup> , 21 <sup>h</sup>                                    | 3 a. m., 4 p. m., 7 p. m., 10 p. m.                             |
| Annapolis, Md.                       | NSS          | 12, 615                  | 17 <sup>h</sup>                                                                                       | 12 noon.                                                        |
|                                      |              | 16, 820                  | 17 <sup>h</sup>                                                                                       | 12 noon.                                                        |
|                                      |              | 17.8                     | 0 <sup>h</sup> , 3 <sup>h</sup> , 5 <sup>h</sup> , 8 <sup>h</sup> , 17 <sup>h</sup> , 21 <sup>h</sup> | 3 a. m., 12 noon, 4 p. m., 7 p. m., 10 p. m., 12 mid-<br>night. |
| Cavite, P. I. (Los Banos)            | NPO          | 22.9                     | 13 <sup>h</sup>                                                                                       | 9 p. m.                                                         |
|                                      |              | 56                       | 4 <sup>h</sup> 30 <sup>m</sup>                                                                        | 12:30 p. m.                                                     |
|                                      |              | 8, 872                   | 4 <sup>h</sup> 30 <sup>m</sup>                                                                        | 12:30 p. m.                                                     |
|                                      |              | 9, 050                   | 13 <sup>h</sup>                                                                                       | 9 p. m.                                                         |
|                                      |              | 17, 744                  | 4 <sup>h</sup> 30 <sup>m</sup>                                                                        | 12:30 p. m.                                                     |
| Darien, C. Z. (Balboa)               | NBA          | 46                       | 3 <sup>h</sup> , 8 <sup>h</sup> , 17 <sup>h</sup>                                                     | 3 a. m., 12 noon, 10 p. m.                                      |
| Honolulu, T. H. (Pearl Harbor).      | NPM          | 8, 090                   | 8 <sup>h</sup> , 17 <sup>h</sup>                                                                      | 1:30 a. m., 9:30 p. m.                                          |
|                                      |              | 16, 180                  | 3 <sup>h</sup>                                                                                        | 4:30 p. m.                                                      |
|                                      |              | 42.8                     | 3 <sup>h</sup> , 8 <sup>h</sup> , 17 <sup>h</sup>                                                     | 9 a. m., 7 p. m., 12 mid-<br>night.                             |
| San Francisco, Calif. (Mare Island). | NPG          | 108                      | 3 <sup>h</sup> , 8 <sup>h</sup> , 17 <sup>h</sup>                                                     | 9 a. m., 7 p. m., 12 mid-<br>night.                             |
|                                      |              | 8, 590                   | 8 <sup>h</sup>                                                                                        | 12 midnight.                                                    |
|                                      |              | 12, 885                  | 3 <sup>h</sup> , 17 <sup>h</sup>                                                                      | 9 a. m., 7 p. m.                                                |

<sup>1</sup> The information given in this table is as of October 1934, and is subject to change by the U. S. Navy Department.

<sup>2</sup> The U. S. Naval Observatory issues its reports in Greenwich civil time and numbers the hours of the day from 1 to 24, beginning at 12 midnight.

## IV. TIME IN FOREIGN COUNTRIES

### 1. TIME ZONES OF THE WORLD

Standard time for the world, like longitude, is counted from Greenwich as the prime meridian. As explained in section II, places to the east of Greenwich have faster time than Greenwich, while places to the west have slower time.

Figure 2 shows how the world is divided into time zones of approximately 15° for every hour. Since Greenwich is in the 0 zone, the number of any zone in figure 2, if added algebraically to the time in Greenwich, will give the corresponding time in that particular zone. It must be remembered that not all countries follow the International Time Zone System, but that some use the time of some principal city as a standard and others have no standard of time. Table 4 and figure 3 will be found useful in such cases.

## 2. INTERNATIONAL DATE LINE

The International Meridian Conference, held in Washington, D. C., in 1884, established as the prime meridian, from which time was to be counted, the meridian passing through Greenwich, England. The meridian  $180^\circ$  from this prime meridian was made the International Date Line, but, in order to include islands of the same group in the same day, it has been necessary to vary the line from the  $180^\circ$  meridian at some places. The official date line runs from  $70^\circ$  N. to  $60^\circ$  S. in accordance with the following description:

Starting at the  $180^\circ$  meridian at  $70^\circ$  N., thence  
southeasterly to  $169^\circ$  W.,  $65^\circ$  N., thence  
southwesterly to  $170^\circ$  E.,  $52^\circ 30'$  N., thence  
southeasterly to the  $180^\circ$  meridian at  $48^\circ$  N., thence  
southerly on the  $180^\circ$  meridian to  $5^\circ$  S., thence  
southeasterly to  $172^\circ 30'$  W.,  $15^\circ 30'$  S., thence  
southwesterly to the  $180^\circ$  meridian at  $51^\circ 30'$  S., thence  
southerly on the  $180^\circ$  meridian to  $60^\circ$  S.

When crossing this line in a westerly direction (i. e., from west longitude to east longitude), the date must be advanced 1 day, and when crossing in an easterly direction (east longitude to west longitude), the date must be set back 1 day.

## 3. TIME IN SEVERAL IMPORTANT CITIES

The following list gives the time in some important cities of the world, outside of continental United States, at 12 noon eastern standard time.

|                              |                       |                                  |                      |
|------------------------------|-----------------------|----------------------------------|----------------------|
| Alexandria, Egypt-----       | 7 p. m.               | London, England-----             | 5 p. m.              |
| Athens, Greece-----          | 7 p. m.               | Madrid, Spain-----               | 5 p. m.              |
| Baghdad, Iraq-----           | 8 p. m.               | Manila, Philippine Islands-----  | 1 a. m. next day.    |
| Bangkok, Siam-----           | 12 midnight.          | Mexico City, Mexico-----         | 11 a. m.             |
| Batavia, Java-----           | 12:30 a. m. next day. | Montevideo, Uruguay-----         | 1:30 p. m.           |
| Berlin, Germany-----         | 6 p. m.               | Montreal, Quebec-----            | 12 noon.             |
| Bombay, India-----           | 10:30 p. m.           | Paris, France-----               | 5 p. m.              |
| Brussels, Belgium-----       | 5 p. m.               | Perth, Western Australia-----    | 1 a. m. next day.    |
| Bucharest, Rumania-----      | 7 p. m.               | Rio de Janeiro, Brazil-----      | 2 p. m.              |
| Buenos Aires, Argentina----- | 1 p. m.               | Rome, Italy-----                 | 6 p. m.              |
| Cape Town, South Africa----- | 7 p. m.               | Shanghai, China-----             | 1 a. m. next day.    |
| Caracas, Venezuela-----      | 12:30 p. m.           | Sydney, New South Wales-----     | 3 a. m. next day.    |
| Copenhagen, Denmark-----     | 6 p. m.               | Tokyo, Japan-----                | 2 a. m. next day.    |
| Dawson, Yukon-----           | 8 a. m.               | Valparaiso, Chile-----           | 12 noon.             |
| Edmonton, Alberta-----       | 10 a. m.              | Vancouver, British Columbia----- | 9 a. m.              |
| Freetown, Sierra Leone-----  | 4 p. m.               | Vienna, Austria-----             | 6 p. m.              |
| Geneva, Switzerland-----     | 6 p. m.               | Wellington, New Zealand-----     | 4:30 a. m. next day. |
| Halifax, Nova Scotia-----    | 1 p. m.               | Winnipeg, Manitoba-----          | 11 a. m.             |
| Havana, Cuba-----            | 12 noon.              |                                  |                      |
| Hong Kong, China-----        | 1 a. m. next day.     |                                  |                      |
| Honolulu, Hawaii-----        | 6:30 a. m.            |                                  |                      |
| Lima, Peru-----              | 12 noon.              |                                  |                      |

## 4. FOREIGN TIME SIGNALS

Several foreign radio stations broadcast official time signals at stated times each day, the time of transmission varying for the different stations.

In some countries the hours of the day are numbered from 0 to 24 beginning at midnight. This is less confusing than the double 12 system used in this country and is the system used in the list given below. The corresponding times in the two systems are:

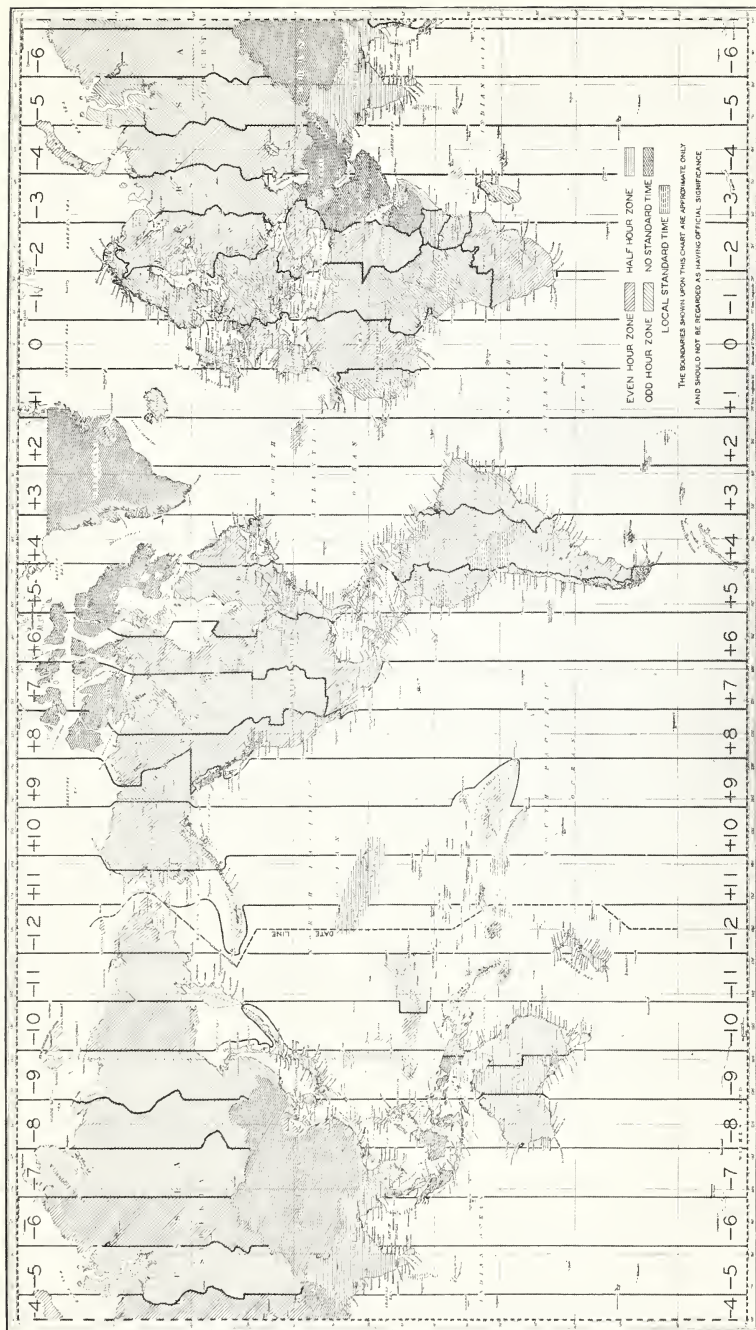


FIGURE 2.—Standard time zones of the world.

East longitude is marked plus (+), and west longitude is marked minus (−). The numbers are the hour differences from Greenwich.



| 24-hour system | Double-12 system | 24-hour system | Double-12 system |
|----------------|------------------|----------------|------------------|
| 1-----         | 1 a. m.          | 13-----        | 1 p. m.          |
| 2-----         | 2 a. m.          | 14-----        | 2 p. m.          |
| 3-----         | 3 a. m.          | 15-----        | 3 p. m.          |
| 4-----         | 4 a. m.          | 16-----        | 4 p. m.          |
| 5-----         | 5 a. m.          | 17-----        | 5 p. m.          |
| 6-----         | 6 a. m.          | 18-----        | 6 p. m.          |
| 7-----         | 7 a. m.          | 19-----        | 7 p. m.          |
| 8-----         | 8 a. m.          | 20-----        | 8 p. m.          |
| 9-----         | 9 a. m.          | 21-----        | 9 p. m.          |
| 10-----        | 10 a. m.         | 22-----        | 10 p. m.         |
| 11-----        | 11 a. m.         | 23-----        | 11 p. m.         |
| 12-----        | 12 noon.         | 0 or 24-----   | 12 midnight.     |

The systems of transmitted signals used by the different stations are not the same. A few stations use a special system of their own, but most stations use one of the systems described below. The signals are preceded by warning or some kind of preliminary signals to indicate the station.

The International System of Time Signals is as follows:

57<sup>m</sup> 0<sup>s</sup> to 57<sup>m</sup> 49<sup>s</sup> the letter X (— . . . —) repeated every 5 seconds

57<sup>m</sup> 50<sup>s</sup> to 57<sup>m</sup> 55<sup>s</sup> silent period

57<sup>m</sup> 55<sup>s</sup> to 58<sup>m</sup> 0<sup>s</sup> 55    56 57    58 59    0

58<sup>m</sup> 8<sup>s</sup> to 58<sup>m</sup> 10<sup>s</sup> 08    09 10

58<sup>m</sup> 18<sup>s</sup> to 58<sup>m</sup> 20<sup>s</sup> 18    19 20

58<sup>m</sup> 28<sup>s</sup> to 58<sup>m</sup> 30<sup>s</sup> 28    29 30

58<sup>m</sup> 38<sup>s</sup> to 58<sup>m</sup> 40<sup>s</sup> 38    39 40

58<sup>m</sup> 48<sup>s</sup> to 58<sup>m</sup> 50<sup>s</sup> 48    49 50

58<sup>m</sup> 50<sup>s</sup> to 58<sup>m</sup> 55<sup>s</sup> silent period

58<sup>m</sup> 55<sup>s</sup> to 59<sup>m</sup> 0<sup>s</sup> 55    56 57    58 59    0

59<sup>m</sup> 6<sup>s</sup> to 59<sup>m</sup> 10<sup>s</sup> 06    07 08    09 10

59<sup>m</sup> 16<sup>s</sup> to 59<sup>m</sup> 20<sup>s</sup> 16    17 18    19 20

59<sup>m</sup> 26<sup>s</sup> to 59<sup>m</sup> 30<sup>s</sup> 26    27 28    29 30

59<sup>m</sup> 36<sup>s</sup> to 59<sup>m</sup> 40<sup>s</sup> 36    37 38    39 40

59<sup>m</sup> 46<sup>s</sup> to 59<sup>m</sup> 50<sup>s</sup> 46    47 48    49 50

59<sup>m</sup> 50<sup>s</sup> to 59<sup>m</sup> 55<sup>s</sup> silent period

59<sup>m</sup> 55<sup>s</sup> to 0<sup>m</sup> 0<sup>s</sup> 55    56 57    58 59    0

The New International System is the same as the International System except that the 3 dashes from 55<sup>s</sup> to 0<sup>s</sup> are replaced by 6 dots 1 second apart, thus, 55    56    57    58    59    0.

TABLE 3.—Radio transmission of foreign time signals

[The times shown in this table are those of the final signal. The system of signals is preceded by warning or identifying signals in each case. The signals are transmitted daily unless otherwise noted.]

| Country     | Station                   | Call letters | Frequency<br>Kilocycles | Time of transmission  |                                    | Type of signal system                    | Controlled by—                                                            |
|-------------|---------------------------|--------------|-------------------------|-----------------------|------------------------------------|------------------------------------------|---------------------------------------------------------------------------|
|             |                           |              |                         | Greenwich civil time  | Standard time of the station       |                                          |                                                                           |
| Europe:     | England                   | GBR          | 15, 66                  | 10 and 18<br>8 and 20 | 10 and 18<br>8 and 20              | Rhythmic.                                | Paris Obs.<br>Do.<br>Do.                                                  |
|             | France                    | FYL          | 15, 66                  | 10 and 18<br>8 and 20 | 10 and 18<br>8 and 20              | New International, followed by Rhythmic. |                                                                           |
|             | France                    | ELE          | 113                     | 9:30 and 22:30        | 9:30 and 22:30                     | do.                                      |                                                                           |
|             | France                    | FYB          | 10, 580                 | 8 and 20              | 8 and 20                           | do.                                      |                                                                           |
| Germany.    | Paris-Pontoise.           | DFY          | 16, 55                  | 0 and 12              | 1 and 13                           | International, followed by Rhythmic.     | Deutschen Seewerte.                                                       |
|             | Nauen.                    |              |                         | 0 and 12              | 1 and 13                           | do.                                      |                                                                           |
| Italy       | Norddeich.                | DAN          | 11, 340                 | 0 and 12              | 1 and 13                           | Special.                                 | Campidoglio Obs.                                                          |
|             | Rome.                     | IRO          | 125                     | 9:30                  | 9:30                               | do.                                      |                                                                           |
| Portugal    | Mansanto.                 | CTV          | 500                     | 9:40                  | 9:40                               | do.                                      | Lisbon Obs.                                                               |
|             |                           |              | 125                     | 9:30                  | 9:30                               | do.                                      |                                                                           |
| Spain.      | San Fernando, Cadiz.      | EBC          | 9, 090                  | 10:17 <sup>1</sup>    | 10:17 <sup>1</sup>                 | International                            | San Fernando Obs.<br>Nauen signal (D.F.Y).<br>Hand transmission.          |
|             | Stockholm.                | SBA          | 11, 539                 | 10:17 <sup>1</sup>    | 10:17 <sup>1</sup>                 | do.                                      |                                                                           |
| Sweden.     | Archangel.                | RGE          | 689                     | 13 <sup>2</sup>       | 13 <sup>2</sup>                    | Special.                                 | Do.                                                                       |
|             | Feodosia.                 | REK          | 375                     | 12                    | 12                                 | do.                                      |                                                                           |
| U. S. S. R. | Leningrad-Podbelskogo.    | RET          | 500                     | 12:05                 | 14:05                              | Special, followed by Rhythmic.           | Pulkovo Obs.                                                              |
|             | Moscow-Oktaybrskaya.      | RAI          | 78, 5                   | 22                    | 0                                  | do.                                      |                                                                           |
| Asia:       |                           |              | 39                      | 21                    | 23                                 | do.                                      | Colombo Obs.                                                              |
|             |                           |              | 5, 769                  | 16                    | 18                                 | do.                                      |                                                                           |
| Ceylon.     | Colombo.                  | VPB          | 130, 4                  | 6                     | 11:30                              | International.                           | Royal Obs., Hong Kong.<br>Central Obs., Peiping.<br>Zi-Ka-Wei Obs.<br>Do. |
|             | Cape d'Agular, Hong Kong. | VPS          | 150                     | 2 and 13              | 22:30                              | Special.                                 |                                                                           |
| China.      | Peiping (Peking)          | XPK          | 214                     | 1 and 11              | 10 and 21                          | do.                                      | Alipore Obs.<br>Fu Lien Obs.                                              |
|             | Shanghai                  | FEZ          | 500                     | 3 and 9               | 9 and 19                           | New International                        |                                                                           |
| India.      | Shanghai (Zi-Ka-Wei) Obs. | 8ZW          | 12, 820                 | 3 and 9               | 11 and 17                          | do.                                      | Alipore Obs.                                                              |
|             | Tsingtao.                 | XORT         | 7, 140                  | 0:30 and 10:30        | 8:30 and 18:30                     | Special                                  |                                                                           |
| Indo-China. | Calcutta.                 | VWC          | 150                     | 8:30 and 16:30        | 14 <sup>3</sup> and 2 <sup>3</sup> | International                            | Fu Lien Obs.                                                              |
|             | Peshawar.                 | VVP          | 166, 7                  | 5:30                  | 11                                 | Special                                  |                                                                           |
| Iraq        | Kien an.                  | FRK          | 500                     | 3                     | 10                                 | do.                                      | Special                                                                   |
|             | Saigon.                   | FZA          | 18, 9                   | 19                    | 2                                  | Modified Rhythmic.                       |                                                                           |
|             | Basra                     | FZR          | 9, 530                  | 19                    | 2                                  | do.                                      |                                                                           |
|             |                           | YIB          | 500                     | 11                    | 14                                 | Special.                                 |                                                                           |

|                            |                                       |              |                     |                                                |                                                 |                                |                                                             |
|----------------------------|---------------------------------------|--------------|---------------------|------------------------------------------------|-------------------------------------------------|--------------------------------|-------------------------------------------------------------|
| Japan.                     | Choshi.....                           | JCS          | 500                 | 2:04 <sup>4</sup> and 12:04 <sup>4</sup> ..... | 11:04 <sup>4</sup> and 21:04 <sup>4</sup> ..... | do.....                        | Astronomical Obs., Tokyo.                                   |
|                            | Okayama.....                          | JOKK         | 700                 | 3 and 12:40.....                               | 12 and 21:40.....                               | do.....                        | Tokyo Central Broadcasting Station.                         |
|                            | Shizuoka.....                         | JOPK         | 780                 | 3 and 12:40.....                               | 12 and 21:40.....                               | do.....                        | Do.                                                         |
|                            | Tokyo (Funabashi).....                | JTC          | 39                  | 1:04 <sup>4</sup> and 12:04 <sup>4</sup> ..... | 11:04 <sup>4</sup> and 21:04 <sup>4</sup> ..... | Special, preceded by Rhythmic. | Astronomical Obs.                                           |
| Africa.                    | Massawa.....                          | IRG          | { 117.4<br>5, 464   | 4 and 18.....                                  | 7 and 21.....                                   | Special.....                   | Pendulum and chronometer checked against Bordeaux (F.Y.L.). |
|                            | Magadiseio (Mogdishu).....            | ISG          | { 153.8<br>5, 450   | 9 and 22.....                                  | 12 and 1.....                                   | do.....                        | Pendulum checked against Bordeaux (F.Y.L.).                 |
|                            | Polona (Lorenzo Marques).....         | CRAP         | { 125<br>500        | 8 and 19.....                                  | 10 and 21.....                                  | New International.....         | Campes Rodrigues Obs.                                       |
|                            | Ponta Vermelha (Lorenzo Marques)..... | CQE          | 500                 | 8 and 19.....                                  | 10 and 21.....                                  | do.....                        | Do.                                                         |
| Union of South Africa.     | Capetown.....                         | ZTC          | 800                 | 21.....                                        | 23.....                                         | do.....                        | Royal Obs.                                                  |
|                            | Stangkop (Capetown).....              | ZSC          | 480                 | 21.....                                        | 23.....                                         | do.....                        | Do.                                                         |
| North America.             | (Chebucto Head, N. S.).....           | VAV          | 500                 | 14.....                                        | 10.....                                         | Special.....                   | St. Johns Obs.                                              |
|                            | (Gonzales Hill, B. C.).....           | VAK          | 405                 | 3 and 18.....                                  | 10 and 17.....                                  | do.....                        | Gonzales Obs.                                               |
|                            | Mexico City (Chapultepec).....        | XDA          | 51.7                | 1 and 19 <sup>4</sup> .....                    | 12 <sup>4</sup> and 18.....                     | U. S. S.....                   | Tacubaya Obs.                                               |
| South America.             | (Buenos Aires-Darsena Norte).....     | LOL          | { 285<br>8, 690     | 2 <sup>6</sup> and 14 <sup>56</sup> .....      | 10 <sup>6</sup> and 22 <sup>56</sup> .....      | New International.....         | Buenos Aires Naval Obs.                                     |
|                            | (Monte Grande).....                   | LSD          | { 8, 830<br>19, 600 | 23:45.....                                     | 19:45.....                                      | Modified Rhythmic.....         |                                                             |
|                            | (National Obs. (Rio de Janeiro).)     | LSF          | 19, 600             | 11:45.....                                     | 7:45.....                                       | do.....                        |                                                             |
|                            | Rio de Janeiro.....                   | PPE          | 8, 720.9            | 0 <sup>4</sup> .....                           | 21 <sup>4</sup> .....                           | New International.....         |                                                             |
| Brazil.                    | Rio de Janeiro.....                   | PPR          | 300                 | 0 <sup>4</sup> .....                           | 21:10 <sup>4</sup> .....                        | U. S. S.....                   | Rio de Janeiro Obs.                                         |
|                            | Valpariso-Las Salinas.....            | GCL          | 140                 | 0 <sup>4</sup> .....                           | 21:20 <sup>4</sup> .....                        | Special.....                   | Do.                                                         |
|                            | La Punta (Callao).....                | OBE          | { 250<br>13, 043    | 19 <sup>2</sup> .....                          | 20 <sup>2</sup> .....                           | New International.....         | Hydrographic Office.                                        |
|                            | Lima-El Progreso.....                 | OAZ          | 85.7                | 19 <sup>2</sup> .....                          | 14 <sup>2</sup> .....                           | Old U. S. S.....               | Naval School of Peru.                                       |
| Australia and East Indies. | (Adelaide, S. A.).....                | VIA          | 500                 | 0:30 and 12:30.....                            | 10 and 22.....                                  | do.....                        | Do.                                                         |
|                            | Melbourne, Victoria.....              | VIM          | 500                 | 2 and 14.....                                  | 0 and 12.....                                   | International.....             | Adelaide Obs.                                               |
|                            | Perth, W. A.....                      | VIP          | 500                 | 1 and 13.....                                  | 9 and 21.....                                   | International.....             | Perth Obs.                                                  |
|                            | (Sidney, N. S. W.).....               | VIS          | 500                 | 3 and 11.....                                  | 13 and 21.....                                  | Special.....                   | Sidney Obs.                                                 |
| Java.                      | Malabar.....                          | { PKX<br>PLA | { 19<br>19          | 1 <sup>2</sup> .....                           | 8:30 <sup>2</sup> .....                         | International.....             |                                                             |
|                            | (Dominion Obs. (Wellington)).....     | PLO          | 14, 440             | 1.....                                         | 8:30.....                                       | do.....                        |                                                             |
|                            | Wellington.....                       | ZLY          | 500                 | 9 <sup>8</sup> and 23.....                     | 20:30 <sup>8</sup> and 10:30.....               | Special.....                   | Dominion Obs.                                               |
|                            | Kuching.....                          | ZLW          | 500                 | 9 <sup>8</sup> and 23.....                     | 20:30 <sup>8</sup> and 10:30.....               | do.....                        | Station ZLY.                                                |
| Sarawak.....               |                                       | VQF          | 193                 | 0.....                                         | 7:30.....                                       | do.....                        |                                                             |

<sup>1</sup> Time signals start at 10 hours.  
<sup>2</sup> Signals not sent on Sundays.  
<sup>3</sup> Indian standard time.  
<sup>4</sup> Signals not sent Sundays and holidays.

<sup>5</sup> Sundays and holidays only.

<sup>6</sup> From Nov. 1 to Mar. 1 the signals are sent 1 hour earlier.

<sup>7</sup> Signals sent Sundays only.

<sup>8</sup> Tuesdays and Fridays only, except on holidays.

The United States System is described on page 6.

The Rhythmic System, sometimes called the coincidence, the scientific, or the vernier system, consists of a series of 61 evenly spaced dots each minute for 5 minutes, making a total of 305 dots in 300 seconds. This system is sometimes modified by replacing the final dot of each minute by a dash.

Table 3, compiled from authoritative sources, lists a number of foreign stations which transmit time signals. When signals end at times other than on the hour, they start the necessary number of seconds ahead of the final signal.

#### 5. COMPARATIVE TIME

In order to illustrate more clearly the difference in time as one travels from place to place upon the earth, the chart shown in figure 3 has been prepared. On this chart the outer circle shows the longitude east and west of Greenwich; the middle circle gives the time as compared with noon in Washington, D. C., and the inner circle shows the time difference from Greenwich.

This diagram will be found useful in picturing the relative locations of various countries and for computing the comparative time between them.

*Example:* The standard meridian for Japan is  $135^{\circ}$  E. and that for Turkey is  $30^{\circ}$  E. What is the time in each place at noon in Washington and what is the time difference between Japan and Turkey?

Following the radius through  $135^{\circ}$  E. toward the center, we find that the time in Japan is 9 hours faster than Greenwich and that its time is 2 a. m. next day when it is noon in Washington.

Following the radius through  $30^{\circ}$  E. toward the center, we find that the time for Turkey is 2 hours faster than Greenwich and that its time is 7 p. m. when it is noon in Washington.

Since Japan is 9 hours faster than Greenwich and Turkey is only 2 hours faster than Greenwich, Japan must be 9 hours minus 2 or 7 hours faster than Turkey.

Where parts of an hour are involved the fraction may be added to the full hour difference shown in the diagram.

*Example:* What is the time in Honolulu ( $157^{\circ}30'$  W.) at noon in Washington and how much difference is there in time between Honolulu and England?

Following the outer circle we find that  $157^{\circ}30'$  W. is halfway between  $150^{\circ}$  W. and  $165^{\circ}$  W. The time of Honolulu must then be half way between the time for the two meridians. The middle circle shows that this would give the time in Honolulu as 6:30 a. m. at noon in Washington, and the inner circle shows that Honolulu time is  $10\frac{1}{2}$  hours slower than Greenwich.

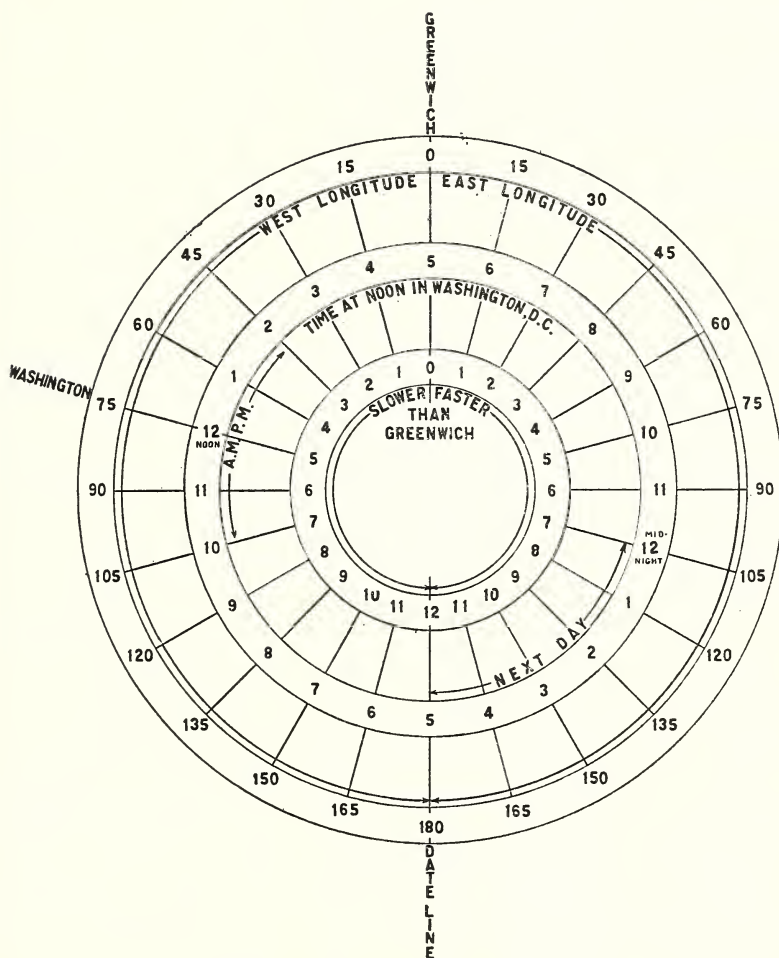


FIGURE 3.—Comparative time chart.

## 6. LEGAL TIME USED IN THE DIFFERENT COUNTRIES

Nearly every country of the world has established a legal time upon which to operate, and also a legal time for islands and dependencies under its control. (See fig. 2.) Table 4 shows the authorized time and compares this time with both Greenwich, England, and Washington, D. C. Where the legal time conforms to the International Standard Time System the standard-time meridian is indicated.

TABLE 4.—Time compared with Greenwich mean time and Washington, D. C., noon

| Country                            | General location          | Standard meridian | Time compared with Greenwich |   |      | Noon at Washington, D. C. (eastern standard time) |   |           | Remarks                |
|------------------------------------|---------------------------|-------------------|------------------------------|---|------|---------------------------------------------------|---|-----------|------------------------|
|                                    |                           |                   | h                            | m | s    | h                                                 | m | s         |                        |
| Admiralty Islands.....             | South Pacific             | 150° E.           | 10                           |   | fast | 3                                                 |   | a. m.     | No standard time.      |
| Afghanistan.....                   | Asia (65° E.)             |                   |                              |   |      |                                                   |   |           |                        |
| Alaska <sup>2</sup> .....          | North America             |                   |                              |   |      |                                                   |   |           | Alaskan standard time. |
| Ketchikan.....                     |                           | 120° W.           | 8                            |   | slow | 9                                                 |   | a. m.     |                        |
| Cordova.....                       |                           |                   |                              |   |      |                                                   |   |           |                        |
| Juneau.....                        |                           | 135° W.           | 9                            |   | slow | 8                                                 |   | a. m.     |                        |
| Sitka.....                         |                           |                   |                              |   |      |                                                   |   |           |                        |
| Southern portion.....              |                           |                   |                              |   |      |                                                   |   |           |                        |
| Central portion.....               |                           | 150° W.           | 10                           |   | slow | 7                                                 |   | a. m.     |                        |
| Aleutian Islands.....              |                           |                   |                              |   |      |                                                   |   |           | Middle European time.  |
| West coast.....                    |                           | 165° W.           | 11                           |   | slow | 6                                                 |   | a. m.     |                        |
| Albania.....                       | Europe                    | 15° E.            | 1                            |   | fast | 6                                                 |   | p. m.     |                        |
| Algeria.....                       | Africa                    | 0°                | 0                            |   |      | 5                                                 |   | p. m.     |                        |
| Amirante Islands.....              | Indian Ocean              | 60° E.            | 4                            |   | fast | 9                                                 |   | p. m.     |                        |
| Andaman Islands.....               | do.                       | 97°30' E.         | 6 30                         |   | fast | 11 30                                             |   | p. m.     |                        |
| Angola.....                        | Africa                    | 15° E.            | 1                            |   | fast | 6                                                 |   | p. m.     |                        |
| Anguilla Island.....               | West Indies               | 60° W.            | 4                            |   | slow | 1                                                 |   | p. m.     |                        |
| Antigua Island.....                | do.                       | 60° W.            | 4                            |   | slow | 1                                                 |   | p. m.     |                        |
| Arabia.....                        | Asia (45° E.)             |                   |                              |   |      |                                                   |   |           | No standard time.      |
| Aden.....                          |                           |                   | 2 59 54                      |   | fast | 7 59 54                                           |   | p. m.     | Aden time.             |
| Argentina.....                     | South America             | 60° W.            | 4                            |   | slow | 1                                                 |   | p. m.     |                        |
| Aru Islands.....                   | East Indies               | 135° E.           | 9                            |   | fast | 2                                                 |   | a. m.     | New Guinea time.       |
| Ascension Island.....              | South Atlantic            | 15° W.            | 1                            |   | slow | 4                                                 |   | p. m.     |                        |
| Auckland Island.....               | South Pacific (165° E.)   |                   |                              |   |      |                                                   |   |           | No standard time       |
| Austral (Tubuai) Islands.....      | South Pacific             | 150° W.           | 10                           |   | slow | 7                                                 |   | a. m.     |                        |
| Australia.....                     | do.                       |                   |                              |   |      |                                                   |   |           |                        |
| Western Australia.....             |                           | 120° E.           | 8                            |   | fast | 1                                                 |   | a. m.     |                        |
| Northern Territory.....            |                           |                   |                              |   |      |                                                   |   |           |                        |
| South Australia.....               |                           | 142°30' E.        | 9 30                         |   | fast | 2 30                                              |   | a. m.     |                        |
| New South Wales.....               |                           |                   |                              |   |      |                                                   |   |           |                        |
| Queensland.....                    |                           | 150° E.           | 10                           |   | fast | 3                                                 |   | a. m.     |                        |
| Victoria.....                      |                           |                   |                              |   |      |                                                   |   |           |                        |
| Austria.....                       | Europe                    | 15° E.            | 1                            |   | fast | 6                                                 |   | p. m.     | Middle European time.  |
| Azore Islands.....                 | North Atlantic            | 30° W.            | 2                            |   | slow | 3                                                 |   | p. m.     |                        |
| Bahama Islands.....                | North Atlantic            | 75° W.            | 5                            |   | slow | 12                                                |   | noon.     |                        |
| Balearic Islands.....              | Mediterranean Sea         | 0°                | 0                            |   |      | 5                                                 |   | p. m.     |                        |
| Bali Island.....                   | East Indies               | 112°30' E.        | 7 30                         |   | fast | 12 30                                             |   | a. m.     | Java time.             |
| Balleney Islands.....              | Antarctic Ocean (162° E.) |                   |                              |   |      |                                                   |   |           | No standard time.      |
| Baluchistan.....                   | India                     | 82°30' E.         | 5 30                         |   | fast | 10 30                                             |   | p. m.     | Indian standard time.  |
| Bangka Island.....                 | East Indies               | 105° E.           | 7                            |   | fast | 12                                                |   | midnight. | South Sumatra time.    |
| Barbados Island.....               | West Indies               | 60° W.            | 4                            |   | slow | 1                                                 |   | p. m.     |                        |
| Bear Island.....                   | Arctic Ocean (20° E.)     |                   |                              |   |      |                                                   |   |           | No standard time.      |
| Bechuanaland.....                  | Africa                    | 30° E.            | 2                            |   | fast | 7                                                 |   | p. m.     |                        |
| Belgium.....                       | Europe                    | 0°                | 0                            |   |      | 5                                                 |   | p. m.     | Western European time. |
| Bennett Island.....                | Arctic Ocean              | 150° E.           | 10                           |   | fast | 3                                                 |   | a. m.     |                        |
| Bermuda Islands.....               | North Atlantic            | 60° W.            | 4                            |   | slow | 1                                                 |   | p. m.     |                        |
| Bessarabia.....                    | Europe                    | 30° E.            | 2                            |   | fast | 7                                                 |   | p. m.     | Eastern European time. |
| Bhutan.....                        | India                     | 82°30' E.         | 5 30                         |   | fast | 10 30                                             |   | p. m.     | Indian standard time.  |
| Billiton Island.....               | East Indies               | 105° E.           | 7                            |   | fast | 12                                                |   | midnight. |                        |
| Bolivia.....                       | South America             | 4 33              |                              |   | slow | 12 27                                             |   | p. m.     | La Paz time.           |
| Borneo.....                        | East Indies               |                   |                              |   |      |                                                   |   |           |                        |
| British North Borneo (Labuan)..... |                           | 120° E.           | 8                            |   | fast | 1                                                 |   | a. m.     |                        |
| Dutch Borneo.....                  |                           |                   |                              |   |      |                                                   |   |           |                        |
| Sarawak.....                       |                           | 112°30' E.        | 7 30                         |   | fast | 12 30                                             |   | a. m.     | Java time.             |

<sup>1</sup> The time noted is in the morning of the following day.<sup>2</sup> Although Congress has authorized only one time, that of 150° W., for Alaska, several times are used and recognized in commerce. The times used are given here.

TABLE 4.—Time compared with Greenwich mean time and Washington, D. C., noon—Continued

| Country                                | General location                      | Standard meridian | Time compared with Greenwich |    |      | Noon at Washington, D. C. (eastern standard time) |          | Remarks                       |
|----------------------------------------|---------------------------------------|-------------------|------------------------------|----|------|---------------------------------------------------|----------|-------------------------------|
|                                        |                                       |                   | h                            | m  | s    | h                                                 | m s      |                               |
| Brazil.....                            | South America.....                    |                   |                              |    |      |                                                   |          |                               |
| Fernando Noronha Is-<br>land.....      |                                       | 30° W.            | 2                            |    | slow | 3                                                 | p. m.    |                               |
| Isle da Trindade.....                  |                                       |                   |                              |    |      |                                                   |          |                               |
| Bahia.....                             |                                       |                   |                              |    |      |                                                   |          |                               |
| Ceara.....                             |                                       |                   |                              |    |      |                                                   |          |                               |
| Esperito Santo.....                    |                                       |                   |                              |    |      |                                                   |          |                               |
| Goyaz.....                             |                                       |                   |                              |    |      |                                                   |          |                               |
| Maranhao.....                          |                                       |                   |                              |    |      |                                                   |          |                               |
| Minas-Geraes.....                      |                                       |                   |                              |    |      |                                                   |          |                               |
| Para.....                              |                                       |                   |                              |    |      |                                                   |          |                               |
| Parana.....                            |                                       | 45° W.            | 3                            |    | slow | 2                                                 | p. m.    |                               |
| Parahyba.....                          |                                       |                   |                              |    |      |                                                   |          |                               |
| Pernambuco.....                        |                                       |                   |                              |    |      |                                                   |          |                               |
| Piauhy.....                            |                                       |                   |                              |    |      |                                                   |          |                               |
| Rio de Janeiro.....                    |                                       |                   |                              |    |      |                                                   |          |                               |
| Rio Grande do Norte.....               |                                       |                   |                              |    |      |                                                   |          |                               |
| Rio Grande do Sul.....                 |                                       |                   |                              |    |      |                                                   |          |                               |
| Santa Catherina.....                   |                                       |                   |                              |    |      |                                                   |          |                               |
| Sao Paulo.....                         |                                       |                   |                              |    |      |                                                   |          |                               |
| Amazonas.....                          |                                       | 60° W.            | 4                            |    | slow | 1                                                 | p. m.    |                               |
| Matto Grosso.....                      |                                       | 75° W.            | 5                            |    | slow | 12                                                | noon     |                               |
| Acre Territory.....                    |                                       | 30° E.            | 2                            |    | fast | 7                                                 | p. m.    |                               |
| Bulgaria.....                          | Europe.....                           |                   |                              |    |      |                                                   |          | Eastern Eu-<br>ropean time.   |
| Burma.....                             | Asia.....                             | 97°30' E.         | 6                            | 30 | fast | 11                                                | 30 p. m. |                               |
| Cameroon.....                          | Africa.....                           |                   |                              |    |      |                                                   |          |                               |
| British.....                           |                                       | 15° E.            | 1                            |    | fast | 6                                                 | p. m.    |                               |
| French.....                            |                                       | 15° E.            | 1                            |    | fast | 6                                                 | p. m.    |                               |
| Campbell Island.....                   | Antarctic Ocean<br>(170° W.).         |                   |                              |    |      |                                                   |          | No standard<br>time.          |
| Canada and Newfound-<br>land.....      | North America.....                    |                   |                              |    |      |                                                   |          |                               |
| Belle Isle.....                        |                                       |                   |                              |    |      |                                                   |          |                               |
| Labrador (coast).....                  |                                       |                   | 3                            | 31 | slow | 1                                                 | 29 p. m. | St. Johns<br>time.            |
| Newfoundland.....                      |                                       |                   |                              |    |      |                                                   |          |                               |
| Anticosti Island.....                  |                                       |                   |                              |    |      |                                                   |          |                               |
| Cape Breton Island.....                |                                       |                   |                              |    |      |                                                   |          |                               |
| Magdalen Island.....                   |                                       |                   |                              |    |      |                                                   |          |                               |
| New Brunswick.....                     |                                       | 60° W.            | 4                            |    | slow | 1                                                 | p. m.    | Atlantic<br>standard<br>time. |
| Nova Scotia.....                       |                                       |                   |                              |    |      |                                                   |          |                               |
| Prince Edward Island.....              |                                       |                   |                              |    |      |                                                   |          |                               |
| Quebec (east of 68° W.).               |                                       |                   |                              |    |      |                                                   |          |                               |
| Sable Island.....                      |                                       |                   |                              |    |      |                                                   |          |                               |
| Melville Peninsula.....                |                                       |                   |                              |    |      |                                                   |          |                               |
| Ontario (east of 90° W.).              |                                       | 75° W.            | 5                            |    | slow | 12                                                | noon     | Eastern<br>standard<br>time.  |
| Quebec (west of 68° W.).               |                                       |                   |                              |    |      |                                                   |          |                               |
| Southampton Island.....                |                                       |                   |                              |    |      |                                                   |          |                               |
| Manitoba.....                          |                                       |                   |                              |    |      |                                                   |          |                               |
| Northwest Territories<br>(eastern). .. |                                       | 90° W.            | 6                            |    | slow | 11                                                | a. m.    | Central<br>standard<br>time.  |
| Ontario (west of 90° W.).              |                                       |                   |                              |    |      |                                                   |          |                               |
| Alberta.....                           |                                       |                   |                              |    |      |                                                   |          |                               |
| Northwest Territories<br>(middle). ..  |                                       | 105° W.           | 7                            |    | slow | 10                                                | a. m.    | Mountain<br>standard<br>time. |
| Saskatchewan.....                      |                                       |                   |                              |    |      |                                                   |          |                               |
| British Columbia.....                  |                                       |                   |                              |    |      |                                                   |          |                               |
| Northwest Territories<br>(western). .. |                                       | 120° W.           | 8                            |    | slow | 9                                                 | a. m.    | Pacific stand-<br>ard time.   |
| Yukon.....                             |                                       | 135° W.           | 9                            |    | slow | 8                                                 | a. m.    | Yukon stand-<br>ard time.     |
| Arctic Islands.....                    | Arctic Ocean<br>North of Can-<br>ada. |                   |                              |    |      |                                                   |          |                               |
| Axel Heiberg Island.....               |                                       |                   |                              |    |      |                                                   |          |                               |
| Baffin Island.....                     |                                       |                   |                              |    |      |                                                   |          |                               |
| Banks Island.....                      |                                       |                   |                              |    |      |                                                   |          |                               |
| Bathurst Island.....                   |                                       |                   |                              |    |      |                                                   |          |                               |
| Boothia Peninsula.....                 |                                       |                   |                              |    |      |                                                   |          |                               |
| Borden Island.....                     |                                       |                   |                              |    |      |                                                   |          |                               |
| Cornwallis Island.....                 |                                       |                   |                              |    |      |                                                   |          |                               |
| Devon Island.....                      |                                       |                   |                              |    |      |                                                   |          |                               |
| Ellesmere Island.....                  |                                       |                   |                              |    |      |                                                   |          | No standard<br>time.          |
| Melville Island.....                   |                                       |                   |                              |    |      |                                                   |          |                               |
| Prince of Wales land.....              |                                       |                   |                              |    |      |                                                   |          |                               |
| Prince Patrick Island.....             |                                       |                   |                              |    |      |                                                   |          |                               |
| Ringnes Island.....                    |                                       |                   |                              |    |      |                                                   |          |                               |
| Somerset Island.....                   |                                       |                   |                              |    |      |                                                   |          |                               |
| Victoria Island.....                   |                                       |                   |                              |    |      |                                                   |          |                               |

TABLE 4.—Time compared with Greenwich mean time and Washington, D. C., noon—Continued

| Country                    | General location           | Standard meridian | Time compared with Greenwich |    |          | Noon at Washington, D. C. (eastern standard time) |    |            | Remarks                        |
|----------------------------|----------------------------|-------------------|------------------------------|----|----------|---------------------------------------------------|----|------------|--------------------------------|
|                            |                            |                   | h                            | m  | s        | h                                                 | m  | s          |                                |
| Canary Islands.....        | North Atlantic..           | 15° W.            | 1                            | 1  | slow     | 4                                                 | 3  | p. m.      |                                |
| Cape Verde Islands.....    | do.                        | 30° W.            | 2                            | 2  | slow     | 3                                                 | 3  | p. m.      |                                |
| Caroline Islands.....      | South Pacific..            | 150° E.           | 10                           | 11 | fast     | 3                                                 | 4  | 1 a. m.    |                                |
| West of 154° E.....        | do.                        | 165° E.           | 11                           | 11 | fast     | 4                                                 | 4  | 1 a. m.    |                                |
| East of 154° E.....        | do.                        | 165° E.           | 11                           | 11 | fast     | 4                                                 | 4  | 1 a. m.    |                                |
| Cayman Islands.....        | West Indies....            | 120° E.           | 5                            | 25 | 36 slow  | 11                                                | 34 | 24 a. m.   |                                |
| Celebes Islands.....       | East Indies....            | 120° E.           | 8                            | 30 | fast     | 1                                                 | 30 | 1 a. m.    | Celebes time.                  |
| Ceram Island.....          | do.                        | 127°30' E.        | 8                            | 30 | fast     | 1                                                 | 30 | 1 a. m.    |                                |
| Ceylon.....                | Indian Ocean...            | 82°30' E.         | 5                            | 30 | fast     | 10                                                | 30 | p. m.      | Indian stand-<br>ard time.     |
| Chad.....                  | Africa.....                | 15° E.            | 1                            | 1  | fast     | 6                                                 | 1  | p. m.      |                                |
| Chagos Archipelago.....    | Indian Ocean...            | 75° E.            | 5                            | 5  | fast     | 10                                                | 5  | p. m.      |                                |
| Channel Islands.....       | English Channel            | 0°                | 0                            | 0  | fast     | 5                                                 | 0  | p. m.      |                                |
| Chatham Island.....        | South Pacific...           | 172°30' E.        | 11                           | 30 | fast     | 4                                                 | 30 | 1 a. m.    |                                |
| Chile.....                 | South America...           | 75° W.            | 5                            | 5  | slow     | 12                                                | 5  | noon.      |                                |
| China.....                 | Asia.....                  |                   |                              |    |          |                                                   |    |            |                                |
| Interior.....              |                            |                   |                              |    |          |                                                   |    |            | No standard<br>time.           |
| Hoihau.....                |                            |                   |                              |    |          |                                                   |    |            |                                |
| Luichow.....               |                            | 105° E.           | 7                            | 7  | fast     | 12                                                | 7  | midnight.  |                                |
| Pakhoi.....                |                            |                   |                              |    |          |                                                   |    |            |                                |
| East Coast.....            |                            |                   |                              |    |          |                                                   |    |            |                                |
| Hong Kong.....             |                            | 120° E.           | 8                            | 8  | fast     | 1                                                 | 8  | 1 a. m.    |                                |
| Macao.....                 |                            |                   |                              |    |          |                                                   |    |            |                                |
| Cocos Islands (Keeling)... | Indian Ocean...            | 97°30' E.         | 6                            | 30 | fast     | 11                                                | 30 | p. m.      |                                |
| Colombia.....              | South America...           | 75° W.            | 5                            | 5  | slow     | 12                                                | 5  | noon.      |                                |
| Comoro Islands.....        | Indian Ocean...            | 45° E.            | 3                            | 3  | fast     | 8                                                 | 3  | p. m.      |                                |
| Congo.....                 | Africa.....                | 15° E.            | 1                            | 1  | fast     | 6                                                 | 1  | p. m.      |                                |
| Belgian.....               |                            | 15° E.            | 1                            | 1  | fast     | 6                                                 | 1  | p. m.      |                                |
| French.....                |                            | 15° E.            | 1                            | 1  | fast     | 6                                                 | 1  | p. m.      |                                |
| Cook Islands.....          | South Pacific<br>(160° W.) |                   | 10                           | 38 | slow     | 6                                                 | 22 | a. m.      |                                |
| Corsica Island.....        | Mediterranean<br>Sea.      | 0°                | 0                            | 0  | fast     | 5                                                 | 0  | p. m.      |                                |
| Costa Rica.....            | Central America            | 90° W.            | 6                            | 6  | slow     | 11                                                | 6  | a. m.      |                                |
| Crete Island.....          | Mediterranean<br>Sea.      | 30° E.            | 2                            | 2  | fast     | 7                                                 | 2  | p. m.      |                                |
| Cuba.....                  | West Indies....            | 75° W.            | 5                            | 5  | slow     | 12                                                | 5  | noon.      |                                |
| Curacao Island.....        | Caribbean Sea<br>(69° W.). |                   | 4                            | 36 | slow     | 12                                                | 24 | p. m.      |                                |
| Cyprus Island.....         | Mediterranean<br>Sea.      | 30° E.            | 2                            | 2  | fast     | 7                                                 | 2  | p. m.      |                                |
| Czechoslovakia.....        | Europe.....                | 15° E.            | 1                            | 1  | fast     | 6                                                 | 1  | p. m.      | Middle E-<br>uropean<br>time.  |
| Dahomey.....               | Africa.....                | 0°                | 0                            | 0  | fast     | 5                                                 | 0  | p. m.      |                                |
| Danzig.....                | Europe.....                | 15° E.            | 1                            | 1  | fast     | 6                                                 | 1  | p. m.      | Middle E-<br>uropean<br>time.  |
| Denmark.....               | do.                        | 15° E.            | 1                            | 1  | fast     | 6                                                 | 1  | p. m.      | Do.                            |
| Dominica Island.....       | West Indies....            | 60° W.            | 4                            | 4  | slow     | 12                                                | 20 | p. m.      |                                |
| Dominican Republic.....    | do.                        |                   | 4                            | 40 | slow     | 12                                                | 20 | p. m.      |                                |
| Ecuador.....               | South America...           |                   |                              |    |          |                                                   |    |            |                                |
| Guayaquil.....             |                            |                   | 5                            | 19 | 24 slow  | 11                                                | 40 | 36 a. m.   |                                |
| Quito.....                 |                            |                   | 5                            | 14 | 6.7 slow | 11                                                | 45 | 53.3 a. m. |                                |
| Egypt.....                 | Africa.....                | 30° E.            | 2                            | 2  | fast     | 7                                                 | 2  | p. m.      |                                |
| Ellice Islands.....        | South Pacific...           | 180° E.           | 12                           | 12 | fast     | 5                                                 | 12 | 1 a. m.    |                                |
| El Salvador.....           | Central America            | 90° W.            | 6                            | 6  | slow     | 11                                                | 6  | a. m.      |                                |
| England.....               | British Isles...           | 0°                | 0                            | 0  | fast     | 5                                                 | 0  | p. m.      | Western E-<br>uropean<br>time. |
| Eritrea.....               | Africa.....                | 45° E.            | 3                            | 3  | fast     | 8                                                 | 3  | p. m.      |                                |
| Estonia.....               | Europe.....                | 30° E.            | 2                            | 2  | fast     | 7                                                 | 2  | p. m.      | Eastern E-<br>uropean<br>time. |
| Tallinn.....               |                            |                   | 1                            | 38 | 57 fast  | 6                                                 | 38 | 57 p. m.   |                                |
| Ethiopia.....              | Africa (40° E.)            |                   |                              |    |          |                                                   |    |            | No standard<br>time.           |
| Falkland Islands.....      | South Atlantic...          | 60° W.            | 4                            | 4  | slow     | 1                                                 | 5  | p. m.      |                                |
| Faroe Islands.....         | British Isles...           | 0°                | 0                            | 0  | fast     | 5                                                 | 0  | p. m.      | Western E-<br>uropean<br>time. |
| Fernando Po Island.....    | South Atlantic...          | 0°                | 0                            | 0  | fast     | 5                                                 | 0  | p. m.      |                                |
| Fiji Islands.....          | South Pacific...           | 180° E.           | 12                           | 12 | fast     | 5                                                 | 12 | 1 a. m.    |                                |

1 The time noted is in the morning of the following day.

TABLE 4.—Time compared with Greenwich mean time and Washington, D. C., noon—Continued

| Country                           | General location                 | Standard meridian | Time compared with Greenwich |    |      |      | Noon at Washington, D. C. (eastern standard time) |    |      | Remarks   |                         |
|-----------------------------------|----------------------------------|-------------------|------------------------------|----|------|------|---------------------------------------------------|----|------|-----------|-------------------------|
| Finland (Soumi) . . . . .         | Europe . . . . .                 | 30° E.            | h                            | m  | s    | fast | h                                                 | m  | s    | p. m.     | Eastern European time.  |
| Flores Island . . . . .           | East Indies . . . . .            | 120° E.           | 8                            |    |      | fast | 1                                                 |    |      | 1 a. m.   |                         |
| Formosa Island (Taiwan) . . . . . | China Sea . . . . .              | 120° E.           | 8                            |    |      | fast | 1                                                 |    |      | 1 a. m.   | Western European time.  |
| France . . . . .                  | Europe . . . . .                 | 0°                | 0                            |    |      |      | 5                                                 |    |      | p. m.     |                         |
| Gabon . . . . .                   | Africa . . . . .                 | 15° E.            | 1                            |    |      | fast | 6                                                 |    |      | p. m.     | No standard time.       |
| Galapagos Islands . . . . .       | South Pacific (90° W.). . . . .  |                   |                              |    |      |      |                                                   |    |      |           |                         |
| Gambia . . . . .                  | Africa . . . . .                 | 15° W.            | 1                            |    |      | slow | 4                                                 |    |      | p. m.     | Middle European time.   |
| Germany . . . . .                 | Europe . . . . .                 | 15° E.            | 1                            |    |      | fast | 6                                                 |    |      | p. m.     |                         |
| Gibraltar . . . . .               | do. . . . .                      | 0°                | 0                            |    |      |      | 5                                                 |    |      | p. m.     | Western European time.  |
| Gilbert Islands . . . . .         | South Pacific . . . . .          | 180° E.           | 12                           |    |      | fast | 5                                                 |    |      | 1 a. m.   |                         |
| Gold Coast . . . . .              | Africa . . . . .                 | 0°                | 0                            |    |      |      | 5                                                 |    |      | p. m.     |                         |
| Great Lyakhov Island . . . . .    | Arctic Ocean . . . . .           | 135° E.           | 9                            |    |      | fast | 2                                                 |    |      | 1 a. m.   | Eastern European time.  |
| Greece . . . . .                  | Europe . . . . .                 | 30° E.            | 2                            |    |      | fast | 7                                                 |    |      | p. m.     |                         |
| Greenland . . . . .               | Arctic Ocean . . . . .           |                   |                              |    |      |      |                                                   |    |      |           | No standard time.       |
| Interior . . . . .                |                                  |                   |                              |    |      |      |                                                   |    |      |           |                         |
| Scoresby Sound . . . . .          |                                  | 30° W.            | 2                            |    |      | slow | 3                                                 |    |      | p. m.     |                         |
| Angmagssalik . . . . .            |                                  |                   |                              |    |      |      |                                                   |    |      |           |                         |
| Disko Island . . . . .            |                                  | 45° W.            | 3                            |    |      | slow | 2                                                 |    |      | p. m.     |                         |
| Western coast . . . . .           |                                  |                   |                              |    |      |      |                                                   |    |      |           |                         |
| Grenada Island . . . . .          | West Indies . . . . .            | 60° W.            | 4                            |    |      | slow | 1                                                 |    |      | p. m.     |                         |
| Guadeloupe Island . . . . .       | do. . . . .                      | 60° W.            | 4                            |    |      | slow | 1                                                 |    |      | p. m.     |                         |
| Guadaloupe Island . . . . .       | North Pacific (120° W.). . . . . |                   |                              |    |      |      |                                                   |    |      |           | No standard time.       |
| Guam Island . . . . .             | North Pacific . . . . .          | 150° E.           | 10                           |    |      | fast | 3                                                 |    |      | 1 a. m.   | Guam standard time.     |
| Guatemala . . . . .               | Central America . . . . .        | 90° W.            | 6                            |    |      | slow | 11                                                |    |      | a. m.     |                         |
| Guiana . . . . .                  | South America . . . . .          |                   |                              |    |      |      |                                                   |    |      |           |                         |
| British . . . . .                 |                                  |                   | 3                            | 45 |      | slow | 1                                                 | 15 |      | p. m.     |                         |
| Dutch . . . . .                   |                                  |                   | 3                            | 40 | 35   | slow | 1                                                 | 19 | 25   | p. m.     |                         |
| French . . . . .                  |                                  | 60° W.            | 4                            |    |      | slow | 1                                                 |    |      | p. m.     |                         |
| Guinea . . . . .                  | Africa . . . . .                 |                   |                              |    |      |      |                                                   |    |      |           |                         |
| French . . . . .                  |                                  | 15° W.            | 1                            |    |      | slow | 4                                                 |    |      | p. m.     |                         |
| Portuguese . . . . .              |                                  | 15° W.            | 1                            |    |      | slow | 4                                                 |    |      | p. m.     |                         |
| Hainan Island . . . . .           | China Sea . . . . .              | 105° E.           | 7                            |    |      | fast | 12                                                |    |      | midnight. |                         |
| Haiti, Republic of . . . . .      | West Indies . . . . .            | 75° W.            | 5                            |    |      | slow | 12                                                |    |      | noon.     |                         |
| Halmahera Island . . . . .        | East Indies . . . . .            | 127°30' E.        | 8                            | 30 |      | fast | 1                                                 | 30 |      | 1 a. m.   | Hawaiian standard time. |
| Hawaiian Islands . . . . .        | North Pacific . . . . .          | 157°30' W.        | 10                           | 30 |      | slow | 6                                                 | 30 |      | a. m.     |                         |
| Hebrides Islands . . . . .        | British Isles . . . . .          | 0°                | 0                            |    |      |      | 5                                                 |    |      | p. m.     | Western European time.  |
| Honduras . . . . .                | Central America . . . . .        | 90° W.            | 6                            |    |      | slow | 11                                                |    |      | a. m.     |                         |
| British Honduras . . . . .        |                                  | 90° W.            | 6                            |    |      | slow | 11                                                |    |      | a. m.     |                         |
| Hungary . . . . .                 | Europe . . . . .                 | 15° E.            | 1                            |    |      | fast | 6                                                 |    |      | p. m.     | Middle European time.   |
| Iceland . . . . .                 | North Atlantic . . . . .         | 15° W.            | 1                            |    |      | slow | 4                                                 |    |      | p. m.     | Indian standard time.   |
| India . . . . .                   | Asia . . . . .                   | 82°30' E.         | 5                            | 30 |      | fast | 10                                                | 30 |      | p. m.     |                         |
| Calcutta . . . . .                |                                  |                   | 5                            | 53 | 20.8 | fast | 10                                                | 53 | 20.8 | p. m.     | Indian standard time.   |
| Chattagong . . . . .              |                                  |                   | 6                            | 07 |      | fast | 11                                                | 07 |      | p. m.     |                         |
| French Establishments . . . . .   |                                  | 82°30' E.         | 5                            | 30 |      | fast | 10                                                | 30 |      | p. m.     | Indian standard time.   |
| Portuguese Goa . . . . .          |                                  | 82°30' E.         | 5                            | 30 |      | fast | 10                                                | 30 |      | p. m.     | Do.                     |
| Indo-China . . . . .              | Asia . . . . .                   | 105° E.           | 7                            |    |      | fast | 12                                                |    |      | midnight. |                         |
| Iraq . . . . .                    | do. . . . .                      | 45° E.            | 3                            |    |      | fast | 8                                                 |    |      | p. m.     |                         |
| Ireland . . . . .                 | British Isles . . . . .          | 0°                | 0                            |    |      |      | 5                                                 |    |      | p. m.     | Western European time.  |

<sup>1</sup> The time noted is in the morning of the following day.

TABLE 4.—Time compared with Greenwich mean time and Washington, D. C., noon—Continued

| Country                                                                              | General location           | Standard meridian | Time compared with Greenwich |      | Noon at Wash- ington, D. C. (eastern stand- ard time) |           | Remarks |                          |
|--------------------------------------------------------------------------------------|----------------------------|-------------------|------------------------------|------|-------------------------------------------------------|-----------|---------|--------------------------|
| Isle of Man.....                                                                     | British Isles.....         | 0°                | h                            | m s  | h                                                     | m s       | p. m.   | Western Eu- ropean time. |
| Isle of Pines.....                                                                   | West Indies.....           | 75° W.            | 5                            | slow | 12                                                    |           | noon.   |                          |
| Italy.....                                                                           | Europe.....                | 15° E.            | 1                            | fast | 6                                                     |           | p. m.   | Middle Eu- ropean time.  |
| Ivory Coast.....                                                                     | Africa.....                | 0°                | 0                            |      | 5                                                     |           | p. m.   |                          |
| Jamaica.....                                                                         | West Indies.....           | 75° W.            | 5                            | slow | 12                                                    |           | noon.   |                          |
| Jan Mayen Island.....                                                                | Arctic Ocean (10° W.).     |                   |                              |      |                                                       |           |         | No standard time.        |
| Japanese Empire.....                                                                 | Asia.....                  | 135° E.           | 9                            | fast | 2                                                     |           | 1 a. m. | Japanese standard time.  |
| Korea (Chosen).....                                                                  |                            | 135° E.           | 9                            | fast | 2                                                     |           | 1 a. m. | Do.                      |
| Jappen Islands.....                                                                  | East Indies.....           | 135° E.           | 9                            | fast | 2                                                     |           | 1 a. m. | New Guinea time.         |
| Java.....                                                                            | do.....                    | 112°30' E.        | 7 30                         | fast | 12 30                                                 |           | 1 a. m. | Java time.               |
| Juan Fernandez Island.....                                                           | South Pacific.....         | 75° W.            | 5                            | slow | 12                                                    |           | noon.   |                          |
| Karaginski Island.....                                                               | Bering Sea.....            | 165° E.           | 11                           | fast | 4                                                     |           | 1 a. m. |                          |
| Kei Islands.....                                                                     | East Indies.....           | 135° E.           | 9                            | fast | 2                                                     |           | 1 a. m. | New Guinea time.         |
| Kenya.....                                                                           | Africa.....                | 37°30' E.         | 2 30                         | fast | 7 30                                                  |           | p. m.   |                          |
| Kodiak Island.....                                                                   | Gulf of Alaska.....        | 150° W.           | 10                           | slow | 7                                                     |           | a. m.   |                          |
| Komandorski Islands.....                                                             | Bering Sea.....            | 165° E.           | 11                           | fast | 4                                                     |           | 1 a. m. |                          |
| Kotelni Island.....                                                                  | Arctic Ocean.....          | 135° E.           | 9                            | fast | 2                                                     |           | 1 a. m. |                          |
| Kuril Islands.....                                                                   | Japan.....                 | 135° E.           | 9                            | fast | 2                                                     |           | 1 a. m. |                          |
| Laccadive Islands.....                                                               | Indian Ocean.....          | 82°30' E.         | 5 30                         | fast | 10 30                                                 |           | p. m.   |                          |
| Latvia.....                                                                          | Europe.....                | 30° E.            | 2                            | fast | 7                                                     |           | p. m.   | Eastern Eu- ropean time. |
| Liberia.....                                                                         | Africa.....                |                   | 0 44                         | slow | 4 16                                                  |           | p. m.   |                          |
| Libia.....                                                                           | do.....                    | 15° E.            | 1                            | fast | 6                                                     |           | p. m.   |                          |
| Liechtenstein.....                                                                   | Europe.....                | 15° E.            | 1                            | fast | 6                                                     |           | p. m.   | Middle Eu- ropean time.  |
| Lithuania.....                                                                       | do.....                    | 15° E.            | 1                            | fast | 6                                                     |           | p. m.   | Do.                      |
| Lombok Island.....                                                                   | East Indies.....           | 112°30' E.        | 7 30                         | fast | 12 30                                                 |           | 1 a. m. | Java time.               |
| Lord Howe Island.....                                                                | South Pacific.....         | 150° E.           | 10                           | fast | 3                                                     |           | 1 a. m. |                          |
| Loyalty Islands.....                                                                 | do.....                    | 165° E.           | 11                           | fast | 4                                                     |           | 1 a. m. |                          |
| Luxemburg.....                                                                       | Europe.....                | 15° E.            | 1                            | fast | 6                                                     |           | p. m.   | Middle Eu- ropean time.  |
| Macquarie Islands.....                                                               | Antarctic Ocean (160° E.). |                   |                              |      |                                                       |           |         | No standard time.        |
| Madagascar Island.....                                                               | Indian Ocean.....          | 45° E.            | 3                            | fast | 8                                                     |           | p. m.   |                          |
| Madeira Island.....                                                                  | North Atlantic.....        | 15° W.            | 1                            | slow | 4                                                     |           | p. m.   |                          |
| Mahon Island.....                                                                    | Mediterranean Sea.....     | 0°                | 0                            |      | 5                                                     |           | p. m.   |                          |
| Malay States, Federated.....                                                         | Asia.....                  | 105° E.           | 7                            | fast | 12                                                    | midnight. |         |                          |
| Maldiv Islands.....                                                                  | Indian Ocean.....          |                   | 4 54                         | fast | 9 54                                                  |           | p. m.   |                          |
| Malta Island.....                                                                    | Mediterranean Sea.....     | 15° E.            | 1                            | fast | 6                                                     |           | p. m.   |                          |
| Marianas Islands (La- drones).....                                                   | South Pacific.....         | 150° E.           | 10                           | fast | 3                                                     |           | 1 a. m. |                          |
| Marquesas Islands.....                                                               | do.....                    | 150° W.           | 10                           | slow | 7                                                     |           | a. m.   |                          |
| Marshall Islands.....                                                                | North Pacific.....         | 165° E.           | 11                           | fast | 4                                                     |           | 1 a. m. |                          |
| Martinique Island.....                                                               | West Indies.....           | 60° W.            | 4                            | slow | 1                                                     |           | p. m.   |                          |
| Mauritania.....                                                                      | Africa.....                | 15° W.            | 1                            | slow | 4                                                     |           | p. m.   |                          |
| Mauritius Island.....                                                                | Indian Ocean.....          | 60° E.            | 4                            | fast | 9                                                     |           | p. m.   |                          |
| Mexico (except lower Cal- ifornia north of 28°). Lower California (north of 28° N.). | North America.....         | 90° W.            | 6                            | slow | 11                                                    |           | a. m.   |                          |
| Miquelon Island.....                                                                 | Gulf of St. Law- rence.    | 120° W.           | 8                            | slow | 9                                                     |           | a. m.   |                          |
| Miquelon Island.....                                                                 | Gulf of St. Law- rence.    | 60° W.            | 4                            | slow | 1                                                     |           | p. m.   | Atlantic standard time.  |
| Monaco.....                                                                          | Europe.....                | 0°                | 0                            |      | 5                                                     |           | p. m.   | Western European time.   |
| Mono Island.....                                                                     | East Indies (155° E.).     |                   |                              |      |                                                       |           |         | No standard time.        |
| Morocco.....                                                                         | Africa.....                | 0°                | 0                            |      | 5                                                     |           | p. m.   |                          |

<sup>1</sup> The time noted is in the morning of the following day.

TABLE 4.—Time compared with Greenwich mean time and Washington, D. C., noon—Continued

| Country                      | General location       | Standard meridian | Time compared with Greenwich |    |           | Noon at Washington, D. C. (eastern standard time) |    |            | Remarks                     |
|------------------------------|------------------------|-------------------|------------------------------|----|-----------|---------------------------------------------------|----|------------|-----------------------------|
|                              |                        |                   | h                            | m  | s         | h                                                 | m  | s          |                             |
| Mozambique.....              | Africa.....            | 30° E.            | 2                            |    | fast      | 7                                                 |    | p. m.      |                             |
| Nauru Island.....            | South Pacific.....     | 165° E.           | 11                           |    | fast      | 4                                                 |    | a. m.      |                             |
| Nepal.....                   | India.....             | 82°30' E.         | 5                            | 30 | fast      | 10                                                | 30 | p. m.      | Indian standard time.       |
| Netherlands.....             | Europe.....            |                   | 0                            | 19 | 32.1 fast | 5                                                 | 19 | 32.1 p. m. | Amsterdam time.             |
| New Britain Island.....      | East Indies.....       | 150° E.           | 10                           |    | fast      | 3                                                 |    | a. m.      |                             |
| New Caledonia Island.....    | South Pacific.....     | 165° E.           | 11                           |    | fast      | 4                                                 |    | a. m.      |                             |
| New Guinea Island.....       | East Indies.....       |                   |                              |    |           |                                                   |    |            |                             |
| Western part (Dutch).....    |                        | 135° E.           | 9                            |    | fast      | 2                                                 |    | a. m.      | New Guinea time.            |
| Eastern part (British).....  |                        | 150° E.           | 10                           |    | fast      | 3                                                 |    | a. m.      |                             |
| New Hebrides Islands.....    | South Pacific.....     | 165° E.           | 11                           |    | fast      | 4                                                 |    | a. m.      |                             |
| New Ireland.....             | East Indies.....       | 150° E.           | 10                           |    | fast      | 3                                                 |    | a. m.      |                             |
| New Siberia Island.....      | Arctic Ocean.....      | 150° E.           | 10                           |    | fast      | 3                                                 |    | a. m.      |                             |
| New Zealand.....             | South Pacific.....     | 172° 30' E.       | 11                           | 30 | fast      | 4                                                 | 30 | a. m.      |                             |
| Nicaragua.....               | Central America.....   |                   | 5                            | 45 | 10 slow   | 11                                                | 14 | 50 a. m.   | Managua time.               |
| Nicobar Islands.....         | Indian Ocean.....      | 97°30' E.         | 6                            | 30 | fast      | 11                                                | 30 | p. m.      |                             |
| Nigeria.....                 | Africa.....            | 15° E.            | 1                            |    | fast      | 6                                                 |    | p. m.      |                             |
| Niger Territory.....         | do.....                |                   |                              |    |           |                                                   |    |            |                             |
| Western.....                 |                        | 0°                | 0                            |    |           | 5                                                 |    | p. m.      |                             |
| Eastern.....                 |                        | 15° E.            | 1                            |    | fast      | 6                                                 |    | p. m.      |                             |
| Norfolk Island.....          | South Pacific.....     |                   | 11                           | 12 | fast      | 4                                                 | 12 | a. m.      |                             |
| Norway.....                  | Europe.....            | 15° E.            | 1                            |    | fast      | 6                                                 |    | p. m.      | Middle European time.       |
| Nova Zembla Island.....      | Arctic Ocean.....      | 60° E.            | 4                            |    | fast      | 9                                                 |    | p. m.      |                             |
| Nunivak Island.....          | Bering Sea.....        | 165° W.           | 11                           |    | slow      | 6                                                 |    | a. m.      |                             |
| Nyasaland.....               | Africa.....            | 30° E.            | 2                            |    | fast      | 7                                                 |    | p. m.      |                             |
| Ocean Island.....            | South Pacific.....     | 165° E.           | 11                           |    | fast      | 4                                                 |    | a. m.      |                             |
| Oceania, French.....         | do.....                | 150° W.           | 10                           |    | slow      | 7                                                 |    | a. m.      |                             |
| Ogasawara Island.....        | Japan.....             | 135° E.           | 9                            |    | fast      | 2                                                 |    | a. m.      |                             |
| Orkney Islands.....          | British Isles.....     | 0°                | 0                            |    |           | 5                                                 |    | p. m.      |                             |
| Palau Islands.....           | East Indies.....       | 135° E.           | 9                            |    | fast      | 2                                                 |    | a. m.      |                             |
| Palestine.....               | Asia.....              | 30° E.            | 2                            |    | fast      | 7                                                 |    | p. m.      |                             |
| Palma Island.....            | Mediterranean Sea..... | 0°                | 0                            |    |           | 5                                                 |    | p. m.      |                             |
| Panama.....                  | Central America.....   | 75° W.            | 5                            |    | slow      | 12                                                |    | noon.      |                             |
| Canal Zone.....              |                        | 75° W.            | 5                            |    | slow      | 12                                                |    | noon.      | Eastern standard time.      |
| Paraguay.....                | South America.....     |                   | 3                            | 37 | 12 slow   | 1                                                 | 22 | 48 p. m.   | Asuncion time.              |
| Persia.....                  | Asia (55° E.).....     |                   |                              |    |           |                                                   |    |            | No standard time.           |
| Peru.....                    | South America.....     | 75° W.            | 5                            |    | slow      | 12                                                |    | noon.      |                             |
| Pescadores Islands.....      | East Indies.....       | 120° E.           | 8                            |    | fast      | 1                                                 |    | a. m.      |                             |
| Philippine Islands.....      | China Sea.....         | 120° E.           | 8                            |    | fast      | 1                                                 |    | a. m.      | Philippine standard time.   |
| Poland.....                  | Europe.....            | 15° E.            | 1                            |    | fast      | 6                                                 |    | p. m.      | Middle European time.       |
| Portugal.....                | do.....                | 0°                | 0                            |    |           | 5                                                 |    | p. m.      | Western European time.      |
| Pribilof Islands.....        | Bering Sea.....        | 165° W.           | 11                           |    | slow      | 6                                                 |    | a. m.      |                             |
| Principe Island.....         | South Atlantic.....    | 0°                | 0                            |    |           | 5                                                 |    | p. m.      |                             |
| Puerto Rico.....             | West Indies.....       | 60° W.            | 4                            |    | slow      | 1                                                 |    | p. m.      | Puerto Rican standard time. |
| Queen Charlotte Islands..... | Gulf of Alaska.....    | 120° W.           | 8                            |    | slow      | 9                                                 |    | a. m.      |                             |
| Raratonga Island.....        | South Pacific.....     |                   | 10                           | 38 | slow      | 6                                                 | 22 | a. m.      |                             |
| Reunion Island.....          | Indian Ocean.....      | 60° E.            | 4                            |    | fast      | 9                                                 |    | p. m.      |                             |
| Rhodes Island.....           | Mediterranean Sea..... | 30° E.            | 2                            |    | fast      | 7                                                 |    | p. m.      | Eastern European time.      |
| Rhodesia.....                | Africa.....            | 30° E.            | 2                            |    | fast      | 7                                                 |    | p. m.      |                             |
| Rio de Oro.....              | do.....                | 15° W.            | 1                            |    | slow      | 4                                                 |    | p. m.      |                             |
| Rio Muni.....                | do.....                | 0°                | 0                            |    |           | 5                                                 |    | p. m.      |                             |

<sup>1</sup> The time noted is in the morning of the following day.

TABLE 4.—Time compared with Greenwich mean time and Washington, D. C., noon—  
Continued

| Country                                | General location             | Standard meridian | Time compared with Greenwich                  | Noon at Washington, D. C. (eastern standard time) | Remarks                 |
|----------------------------------------|------------------------------|-------------------|-----------------------------------------------|---------------------------------------------------|-------------------------|
| Rumania.....                           | Europe.....                  | 30° E.            | <sup>h</sup> 2 <sup>m</sup> <sup>s</sup> fast | <sup>h</sup> 7 <sup>m</sup> <sup>s</sup> p. m.    | Eastern European time.  |
| Sakhalin Island.....                   | Sea of Japan.....            | 135° E.           | 9 fast                                        | 2 1 a. m.                                         | Japanese standard time. |
| Samoa Islands.....                     | South Pacific.....           | 165° W.           | 11 slow                                       | 6 a. m.                                           | Samoa standard time.    |
| Eastern (American).....                |                              |                   |                                               |                                                   |                         |
| Western (British).....                 |                              | 172°30' W.        | 11 30 slow                                    | 5 30 a. m.                                        |                         |
| Sandalwood Island.....                 | East Indies.....             | 120° E.           | 8 fast                                        | 1 1 a. m.                                         |                         |
| Sandwich Islands.....                  | South Atlantic (25° W.)..... |                   |                                               |                                                   | No standard time.       |
| Santa Cruz Islands.....                | South Pacific.....           | 165° E.           | 11 fast                                       | 4 1 a. m.                                         |                         |
| Sardinia Island.....                   | Mediterranean Sea.....       | 15° E.            | 1 fast                                        | 6 p. m.                                           | Middle European time.   |
| Savage Island (Niue).....              | South Pacific.....           |                   | 11 20 slow                                    | 5 40 a. m.                                        |                         |
| Schouten Islands.....                  | East Indies.....             | 135° E.           | 9 fast                                        | 2 1 a. m.                                         | New Guinea time.        |
| Scotland.....                          | British Isles.....           | 0°                | 0                                             | 5 p. m.                                           | Western European time.  |
| Senegal.....                           | Africa.....                  | 15° W.            | 1 slow                                        | 4 p. m.                                           |                         |
| Seychelles Islands.....                | Indian Ocean.....            | 60° E.            | 4 fast                                        | 9 p. m.                                           |                         |
| Shetland Islands.....                  | British Isles.....           | 0°                | 0                                             | 5 p. m.                                           | Western European time.  |
| Siam.....                              | Asia.....                    | 105° E.           | 7 fast                                        | 12 midnight.                                      |                         |
| Sicily Island.....                     | Mediterranean Sea.....       | 15° E.            | 1 fast                                        | 6 p. m.                                           | Middle European time.   |
| Sierra Leone.....                      | Africa.....                  | 15° W.            | 1 slow                                        | 4 p. m.                                           |                         |
| Society Islands.....                   | South Pacific.....           | 150° W.           | 10 slow                                       | 7 a. m.                                           |                         |
| Sokotra Island.....                    | Arabian Sea.....             | 45° E.            | 3 fast                                        | 8 p. m.                                           |                         |
| Solomon Islands.....                   | South Pacific (160° E.)..... |                   |                                               |                                                   | No standard time.       |
| Somaliland.....                        | Africa.....                  |                   |                                               |                                                   |                         |
| British.....                           |                              |                   | 2 59 54 fast                                  | 7 59 54 p. m.                                     | Aden time.              |
| French coast.....                      |                              | 45° E.            | 3 fast                                        | 8 p. m.                                           |                         |
| Italian.....                           |                              | 45° E.            | 3 fast                                        | 8 p. m.                                           |                         |
| South Georgia Islands.....             | South Atlantic (45° W.)..... |                   | 2 07 slow                                     | 2 53 p. m.                                        |                         |
| South Orkney Islands.....              | South Atlantic (45° W.)..... |                   |                                               |                                                   | No standard time.       |
| South Shetland Islands.....            | South Atlantic (60° W.)..... |                   |                                               |                                                   | Do.                     |
| Southwest Africa.....                  | Africa.....                  | 30° E.            | 2 fast                                        | 7 p. m.                                           |                         |
| Soviet Union (U. S. S. R.).....        | Europe and Asia.....         |                   |                                               |                                                   |                         |
| Central Black Soil Area (western)..... |                              |                   |                                               |                                                   |                         |
| Crimean S. S. R.....                   |                              |                   |                                               |                                                   |                         |
| Ivanovo Industrial Area (western)..... |                              |                   |                                               |                                                   |                         |
| Karelian S. S. R.....                  |                              |                   |                                               |                                                   |                         |
| Kola Peninsula.....                    |                              |                   |                                               |                                                   |                         |
| Leningrad Area.....                    |                              | 30° E.            | 2 fast                                        | 7 p. m.                                           | Eastern European time.  |
| Moldavian S. S. R.....                 |                              |                   |                                               |                                                   |                         |
| Moscow Industrial Area.....            |                              |                   |                                               |                                                   |                         |
| Northern Area (western).....           |                              |                   |                                               |                                                   |                         |
| Ukrainian S. S. R.....                 |                              |                   |                                               |                                                   |                         |
| Western Area.....                      |                              |                   |                                               |                                                   |                         |
| White Russian S. S. R.....             |                              |                   |                                               |                                                   |                         |
| Abkhassian S. S. R.....                |                              |                   |                                               |                                                   |                         |
| Adzharsk S. S. R.....                  |                              |                   |                                               |                                                   |                         |
| Armenian S. S. R.....                  |                              |                   |                                               |                                                   |                         |
| Azerbaidjan S. S. R.....               |                              |                   |                                               |                                                   |                         |
| Bashkirian S. S. R.....                |                              |                   |                                               |                                                   |                         |
| (western).....                         |                              |                   |                                               |                                                   |                         |
| Central Black Soil Area (eastern)..... |                              | 45° E.            | 3 fast                                        | 8 p. m.                                           |                         |
| Chuvash S. S. R.....                   |                              |                   |                                               |                                                   |                         |
| Daghestan S. S. R.....                 |                              |                   |                                               |                                                   |                         |
| Georgian S. S. R.....                  |                              |                   |                                               |                                                   |                         |
| German Volga S. S. R.....              |                              |                   |                                               |                                                   |                         |

1 The time noted is in the morning of the following day.

TABLE 4.—Time compared with Greenwich mean time and Washington, D. C., noon—Continued

| Country                                      | General location       | Standard meridian | Time compared with Greenwich |      | Noon at Washington, D. C. (eastern standard time) |                    | Remarks                |
|----------------------------------------------|------------------------|-------------------|------------------------------|------|---------------------------------------------------|--------------------|------------------------|
| <b>Soviet Union (U. S. S. R.)—Continued.</b> |                        |                   | h                            | m s  | h                                                 | m s                |                        |
| Ivanovo Industrial Area (eastern).           |                        |                   |                              |      |                                                   |                    |                        |
| Kalmyk Area.....                             |                        |                   |                              |      |                                                   |                    |                        |
| Kazak S. S. R. (western).                    |                        |                   |                              |      |                                                   |                    |                        |
| Lower Volga Area.....                        |                        |                   |                              |      |                                                   |                    |                        |
| Mari Area.....                               |                        |                   |                              |      |                                                   |                    |                        |
| Middle Volga Area.....                       |                        | 45° E.            | 3                            | fast | 8                                                 | p. m.              |                        |
| Nakhichevan S. S. R.....                     |                        |                   |                              |      |                                                   |                    |                        |
| Nizhni-Novgorod Area.....                    |                        |                   |                              |      |                                                   |                    |                        |
| North Caucasian Area.....                    |                        |                   |                              |      |                                                   |                    |                        |
| Northern Area (central).                     |                        |                   |                              |      |                                                   |                    |                        |
| Tatar S. S. R.....                           |                        |                   |                              |      |                                                   |                    |                        |
| Tvanovo Industrial Area (eastern).           |                        |                   |                              |      |                                                   |                    |                        |
| Ural Area (western).....                     |                        |                   |                              |      |                                                   |                    |                        |
| Votiak Area.....                             |                        |                   |                              |      |                                                   |                    |                        |
| Zyryan Area (western).                       |                        |                   |                              |      |                                                   |                    |                        |
| Badakhshansk Area.....                       |                        |                   |                              |      |                                                   |                    |                        |
| Bashkir S. S. R. (eastern).                  |                        |                   |                              |      |                                                   |                    |                        |
| Kara Kalpak Area.....                        |                        |                   |                              |      |                                                   |                    |                        |
| Kazak S. S. R. (central).                    |                        |                   |                              |      |                                                   |                    |                        |
| Middle Volga Area (southeastern).            |                        | 60° E.            | 4                            | fast | 9                                                 | p. m.              |                        |
| Northern Area (northeastern).                |                        |                   |                              |      |                                                   |                    |                        |
| Tadzhik S. S. R.....                         |                        |                   |                              |      |                                                   |                    |                        |
| Turkmen S. S. R.....                         |                        |                   |                              |      |                                                   |                    |                        |
| Ural Area (central).....                     |                        |                   |                              |      |                                                   |                    |                        |
| Uzbek S. S. R.....                           |                        |                   |                              |      |                                                   |                    |                        |
| Zyryan Area (eastern).                       |                        |                   |                              |      |                                                   |                    |                        |
| Kazak S. S. R. (eastern).                    |                        |                   |                              |      |                                                   |                    |                        |
| Kirghiz S. S. R.....                         |                        | 75° E.            | 5                            | fast | 10                                                | p. m.              |                        |
| Siberian Area (western).                     |                        |                   |                              |      |                                                   |                    |                        |
| Ural Area (eastern).                         |                        |                   |                              |      |                                                   |                    |                        |
| Yamal Peninsula.....                         |                        |                   |                              |      |                                                   |                    |                        |
| Oyrat Area.....                              |                        | 90° E.            | 6                            | fast | 11                                                | p. m.              |                        |
| Siberian Area (central).                     |                        |                   |                              |      |                                                   |                    |                        |
| Mongolo-Buryat S. S. R.                      |                        |                   |                              |      |                                                   |                    |                        |
| Siberian Area (eastern).                     |                        | 105° E.           | 7                            | fast | 12                                                | midnight.          |                        |
| Yakutsk S. S. R. (western).                  |                        |                   |                              |      |                                                   |                    |                        |
| Far Eastern Area (western).                  |                        |                   |                              |      |                                                   |                    |                        |
| Siberian Area (southeastern).                |                        | 120° E.           | 8                            | fast | 1                                                 | <sup>1</sup> a. m. |                        |
| Yakutsk S. S. R. (west central).             |                        |                   |                              |      |                                                   |                    |                        |
| Far Eastern Area (west central).             |                        |                   |                              |      |                                                   |                    |                        |
| Sakhalin Island.....                         |                        | 135° E.           | 9                            | fast | 2                                                 | <sup>1</sup> a. m. |                        |
| Yakutsk S. S. R. (central).                  |                        |                   |                              |      |                                                   |                    |                        |
| Far Eastern Area (central).                  |                        |                   |                              |      |                                                   |                    |                        |
| Yakutsk S. S. R. (east central).             |                        | 150° E.           | 10                           | fast | 3                                                 | <sup>1</sup> a. m. |                        |
| Far Eastern Area (east central).             |                        |                   |                              |      |                                                   |                    |                        |
| Kamchatka.....                               |                        | 165° E.           | 11                           | fast | 4                                                 | <sup>1</sup> a. m. |                        |
| Yakutsk S. S. R. (eastern).                  |                        |                   |                              |      |                                                   |                    |                        |
| Far Eastern Area (eastern).                  |                        | 180° E.           | 12                           | fast | 5                                                 | <sup>1</sup> a. m. |                        |
| Spain.....                                   | Europe.....            | 0°                | 0                            |      | 5                                                 | p. m.              | Western European time. |
| Spitzbergen.....                             | Arctic Ocean (12° E.). |                   |                              |      |                                                   |                    | No standard time.      |
| Staten Island.....                           | South Atlantic.....    | 60° W.            | 4                            | slow | 1                                                 | p. m.              |                        |
| St. Croix Island.....                        | West Indies.....       | 60° W.            | 4                            | slow | 1                                                 | p. m.              |                        |
| St. Helena Island.....                       | South Atlantic.....    |                   | 0 23                         | slow | 4 37                                              | p. m.              |                        |
| St. Lawrence Island.....                     | Bering Sea.....        | 165° W.           | 11                           | slow | 6                                                 | a. m.              |                        |
| St. Lucia Island.....                        | West Indies.....       | 60° W.            | 4                            | slow | 1                                                 | p. m.              |                        |
| St. Matthew Island.....                      | Bering Sea.....        | 165° W.           | 11                           | slow | 6                                                 | a. m.              |                        |

<sup>1</sup> The time noted is in the morning of the following day.

TABLE 4.—Time compared with Greenwich mean time and Washington, D. C., noon—  
Continued

| Country                        | General location         | Standard meridian | Time compared with Greenwich |    |      | Noon at Washington, D. C. (eastern standard time) |           |         | Remarks                 |
|--------------------------------|--------------------------|-------------------|------------------------------|----|------|---------------------------------------------------|-----------|---------|-------------------------|
| St. Miguel Island.....         | North Atlantic.....      | 30° W.            | h                            | m  | s    | h                                                 | m         | s       |                         |
| St. Pierre Island.....         | Gulf of St. Lawrence.    | 60° W.            | 2                            | 4  | slow | 3                                                 |           | p. m.   |                         |
| St. Thomas Island (Sao Thomé). | South Atlantic.....      | 0°                | 0                            |    |      | 5                                                 |           | p. m.   |                         |
| St. Thomas Island.....         | West Indies.....         | 60° W.            | 4                            |    | slow | 1                                                 |           | p. m.   |                         |
| St. Vincent Island.....        | do.....                  | 60° W.            | 4                            |    | slow | 1                                                 |           | p. m.   |                         |
| Straits Settlements.....       | Asia (105° E.).....      |                   | 7                            | 20 | fast | 12                                                | 20        | 1 a. m. |                         |
| Sudan.....                     | Africa.....              |                   |                              |    |      |                                                   |           |         |                         |
| Anglo-Egyptian.....            |                          | 30° E.            | 2                            |    | fast | 7                                                 |           | p. m.   |                         |
| French.....                    |                          |                   |                              |    |      |                                                   |           |         |                         |
| Eastern.....                   |                          | 0°                | 0                            |    |      | 5                                                 |           | p. m.   |                         |
| Western.....                   |                          | 15° W.            | 1                            |    | slow | 4                                                 |           | p. m.   |                         |
| Sumatra.....                   | East Indies.....         |                   |                              |    |      |                                                   |           |         |                         |
| Northern.....                  |                          | 97°30' E.         | 6                            | 30 | fast | 11                                                | 30        | p. m.   | North Sumatra time.     |
| Southern.....                  |                          | 105° E.           | 7                            |    | fast | 12                                                | midnight. |         | South Sumatra time.     |
| Sumbawa Island.....            | East Indies.....         | 120° E.           | 8                            |    | fast | 1                                                 |           | 1 a. m. |                         |
| Sweden.....                    | Europe.....              | 15° E.            | 1                            |    | fast | 6                                                 |           | p. m.   | Middle European time.   |
| Switzerland.....               | do.....                  | 15° E.            | 1                            |    | fast | 6                                                 |           | p. m.   | Do.                     |
| Syria.....                     | Asia.....                | 30° E.            | 2                            |    | fast | 7                                                 |           | p. m.   |                         |
| Tanganyika.....                | Africa.....              | 45° E.            | 3                            |    | fast | 8                                                 |           | p. m.   |                         |
| Tanibar Islands.....           | East Indies.....         | 135° E.           | 9                            |    | fast | 2                                                 |           | 1 a. m. |                         |
| Tasmania.....                  | Australia.....           | 150° E.           | 10                           |    | fast | 3                                                 |           | 1 a. m. |                         |
| Thaddæus Island.....           | Arctic Ocean.....        | 150° E.           | 10                           |    | fast | 3                                                 |           | 1 a. m. |                         |
| Timor Island.....              | East Indies.....         | 120° E.           | 8                            |    | fast | 1                                                 |           | 1 a. m. | Celebes time.           |
| Timor Laut Island.....         | do.....                  | 135° E.           | 9                            |    | fast | 2                                                 |           | 1 a. m. |                         |
| Tobago Island.....             | West Indies.....         | 60° W.            | 4                            |    | slow | 1                                                 |           | p. m.   |                         |
| Togoland.....                  | Africa.....              | 0°                | 0                            |    |      | 5                                                 |           | p. m.   |                         |
| Tonga (Friendly) Islands.      | South Pacific (175° W.). |                   | 12                           | 20 | fast | 5                                                 | 20        | 1 a. m. |                         |
| Trinidad, British.....         | West Indies.....         | 60° W.            | 4                            |    | slow | 1                                                 |           | p. m.   |                         |
| Tripolitania.....              | Africa.....              | 15° E.            | 1                            |    | fast | 6                                                 |           | p. m.   |                         |
| Tuamotu (Low) Archipelago.     | South Pacific.....       | 150° W.           | 10                           |    | slow | 7                                                 |           | a. m.   |                         |
| Tunisia.....                   | Africa.....              | 15° E.            | 1                            |    | fast | 6                                                 |           | p. m.   |                         |
| Turkey.....                    | Europe and Asia.....     | 30° E.            | 2                            |    | fast | 7                                                 |           | p. m.   | Eastern European time.  |
| Turks Island.....              | West Indies.....         | 75° W.            | 5                            |    | slow | 12                                                |           | noon.   |                         |
| Ubangi Shari.....              | Africa.....              | 15° E.            | 1                            |    | fast | 6                                                 |           | p. m.   |                         |
| Uganda.....                    | do.....                  | 37°30' E.         | 2                            | 30 | fast | 7                                                 | 30        | p. m.   |                         |
| Union of South Africa          | do.....                  |                   |                              |    |      |                                                   |           |         |                         |
| Cape Colony.....               |                          |                   |                              |    |      |                                                   |           |         |                         |
| Natal.....                     |                          | 30° E.            | 2                            |    | fast | 7                                                 |           | p. m.   |                         |
| Orange Free State.....         |                          |                   |                              |    |      |                                                   |           |         |                         |
| Transvaal.....                 |                          |                   |                              |    |      |                                                   |           |         |                         |
| United States of America.      | North America.....       |                   |                              |    |      |                                                   |           |         |                         |
| Eastern.....                   |                          | 75° W.            | 5                            |    | slow | 12                                                |           | noon.   | Eastern standard time.  |
| Central.....                   |                          | 90° W.            | 6                            |    | slow | 11                                                |           | a. m.   | Central standard time.  |
| Mountain.....                  |                          | 105° W.           | 7                            |    | slow | 10                                                |           | a. m.   | Mountain standard time. |
| Pacific.....                   |                          | 120° W.           | 8                            |    | slow | 9                                                 |           | a. m.   | Pacific standard time.  |
| Uruguay.....                   | South America.....       | 52°30' W.         | 3                            | 30 | slow | 1                                                 | 30        | p. m.   |                         |
| Venezuela.....                 | do.....                  | 67°30' W.         | 4                            | 30 | slow | 12                                                | 30        | p. m.   |                         |
| Virgin Islands.....            | West Indies.....         | 60° W.            | 4                            |    | slow | 1                                                 |           | p. m.   |                         |
| Volcano Islands.....           | Sea of Japan.....        | 135° E.           | 9                            |    | fast | 2                                                 |           | 1 a. m. |                         |
| Wales.....                     | British Isles.....       | 0°                | 0                            |    |      | 5                                                 |           | p. m.   | Western European time.  |
| Wrangell Island.....           | Arctic Ocean.....        | 180° E.           | 12                           |    | fast | 5                                                 |           | 1 a. m. |                         |

1 The time noted is in the morning of the following day.

TABLE 4.—Time compared with Greenwich mean time and Washington, D. C., noon—Continued

| Country              | General location  | Standard meridian | Time compared with Greenwich | Noon at Washington, D. C. (eastern standard time) | Remarks                 |
|----------------------|-------------------|-------------------|------------------------------|---------------------------------------------------|-------------------------|
| Yap Island.....      | Sea of Japan..... | 135° E.           | h m s fast<br>9              | h m s a. m.<br>2       1 a. m.                    | Japanese standard time. |
| Yugoslavia.....      | Europe.....       | 15° E.            | 1       fast                 | 6       p. m.                                     | Middle European time.   |
| Zanzibar Island..... | Indian Ocean..... | 45° E.            | 3       fast                 | 8       p. m.                                     |                         |

<sup>1</sup> The time noted is in the morning of the following day.

## V. SUMMER OR DAYLIGHT SAVING TIME

The use of summer or daylight saving time developed largely during the World War. The plan was to advance the time in a certain area by a definite amount during the summer months to permit greater use of daylight hours.

In the United States, Congress in the Act for Saving Daylight passed in March 1918, advanced the time for all sections of the country 1 hour from the last Sunday in April to the last Sunday in September, the change being made at 2 a. m. when it would cause the least disturbance in schedules. This act was reenacted in October 1919 omitting the daylight saving clause, but some States and communities still use daylight saving time by local legislation. The use is by no means general and is entirely a matter of local legislation, having no effect on standard time or time zone boundaries.

Canada took similar action by the adoption of the Daylight Saving Act of 1918. This act lapsed after that year, but, as in the United States, certain sections still continue to use daylight saving time by local legislation.

In Europe "summer time" was used by many countries, but the method and time of application varied greatly. Some countries have retained the summer time laws and still use advanced time for certain periods of the year.

Table 5 gives the countries using summer time and the period of the year in which it is applied.

TABLE 5.—Countries using "summer time"<sup>1</sup>

| Country             | Period when used                                                                              | Advance made                |
|---------------------|-----------------------------------------------------------------------------------------------|-----------------------------|
| Great Britain.....  | { Apr. 14, 2 a. m. to Oct. 6, 2 a. m. ....                                                    | 1 hour.                     |
| Ireland.....        |                                                                                               |                             |
| Channel Island..... |                                                                                               |                             |
| Belgium.....        |                                                                                               |                             |
| Luxemburg.....      |                                                                                               |                             |
| France.....         | { Last Saturday in March to first Saturday in October.....                                    | 1 hour.                     |
| Corsica.....        |                                                                                               |                             |
| Monaco.....         |                                                                                               |                             |
| Portugal.....       | Fixed annually.....                                                                           | 1 hour.<br>20 min-<br>utes. |
| Netherlands.....    | April to October by Royal Decree.....                                                         |                             |
| Gold Coast.....     | September 1 to December 31.....                                                               |                             |
| U. S. S. R.....     | The time for all zones in the Union was advanced 1 hour from June 20 to Sept. 30, 1930, only. |                             |

<sup>1</sup> This table was compiled largely from notes in the 1935 Report of the Nautical Almanac Office, Royal Naval College, England.

TABLE 5.—Countries using "summer time"—Continued

| Country               | Period when used                                                      | Advances made |
|-----------------------|-----------------------------------------------------------------------|---------------|
| Sarawak.....          | September 14 (midnight) to December 14 (midnight).....                | 20 min-utes.  |
| New Zealand.....      | Second Sunday in October to third Sunday in March.....                | 30 min-utes.  |
| Canada.....           | By local legislation only.....                                        |               |
| United States.....    | do.....                                                               |               |
| British Honduras..... | October 1 to February 14 (approximately).....                         | 30 min-utes.  |
| Chile.....            | September 1 to March 31.....                                          | 1 hour.       |
| Argentina.....        | Fixed annually.....                                                   |               |
| Falkland Islands..... | Last week end in September to next to last week end in March.....     | 1 hour.       |
| Newfoundland.....     | First Sunday in May (10 p. m.) to first Sunday in October (11 p. m.). | 1 hour.       |

## VI. SELECTED REFERENCES

The following list is intended to give the reader sources of general and specific information on standard time. The indexes of the publications named give specific references to the subject.

- British Astronomical Association (London) Journal.  
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